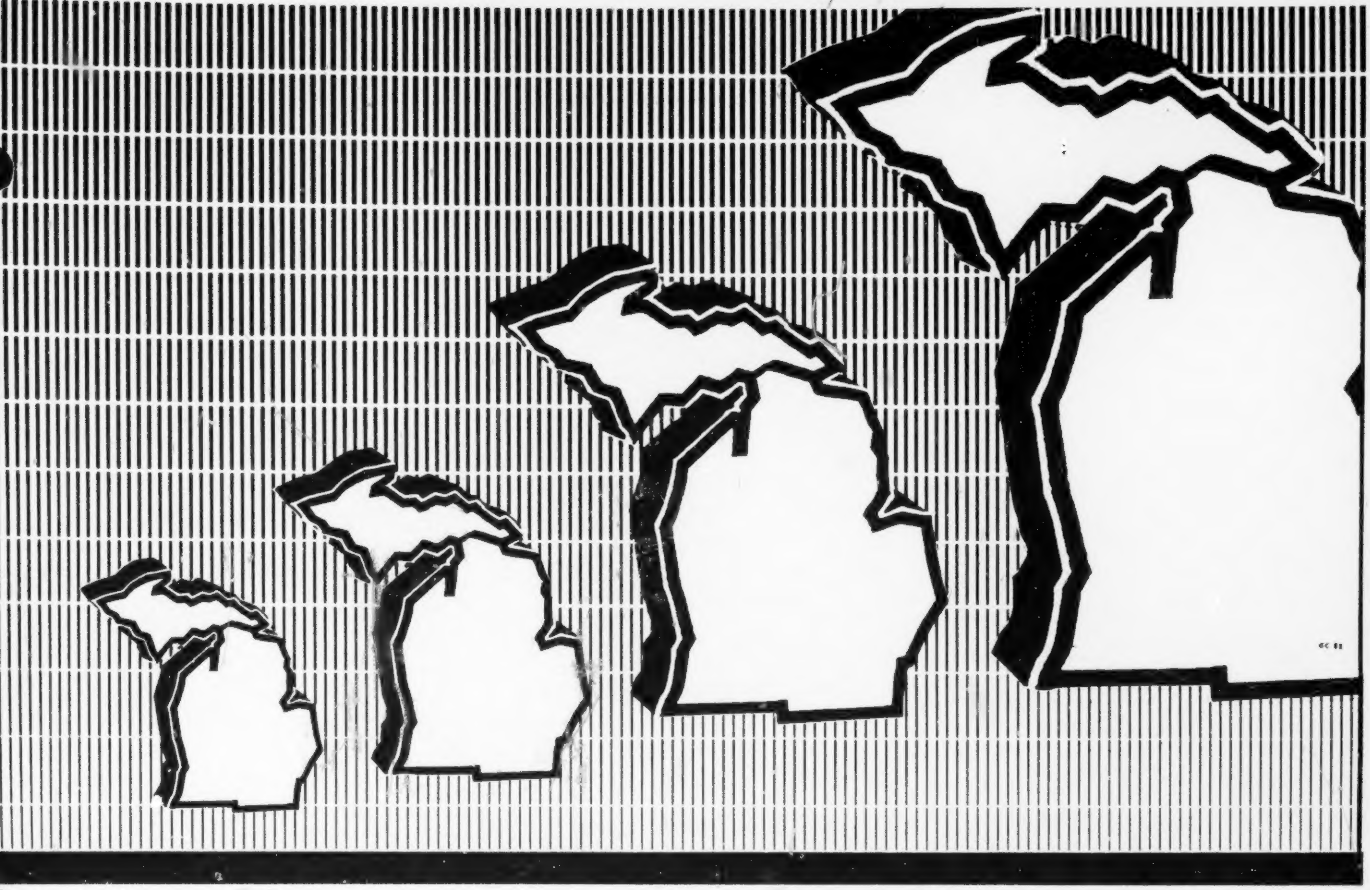

Michigan

HEALTH STATISTICS 1981

MICHIGAN DEPARTMENT OF PUBLIC HEALTH • OFFICE OF VITAL AND HEALTH STATISTICS

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INTRODUCTION

The 1981 edition of Michigan Health Statistics is a statistical summary of vital events for calendar year 1981. Data relative to population, births, deaths, fetal deaths, marriages, divorces and communicable diseases are included. Although most of the data in this report pertain to events occurring in 1981, some data for prior years have been included to illustrate trends. Most of the tabulations refer to Michigan residents. Some events, however, such as marriages and divorces are tabulated with respect to where the event occurred rather than the residence of the party or parties involved.

As a certain number of Michigan residents either deliver babies or die out of state each year, it is necessary to include data obtained from the certificates of other states in any tabulations pertaining to Michigan residents. This report includes all such out-of-state certificates received prior to April 30, 1982, and all in-state certificates and records received prior to March 15, 1982. Although a few records for the calendar year 1981 were received after these filing dates, their exclusion from this report is statistically insignificant.

This report is composed of the following sections and appendices:

1. Natality Section, 2. Mortality Section, 3. Marriage and Divorce Section, 4. Reference Appendix.

Comments or suggestions concerning the content and format of this report are always welcome. Any additional needs for data or analyses may be directed to the Office of Vital and Health Statistics. A summary of prepared vital statistics tabulations, Index to Michigan Vital Statistics 1960 to Present, is also available. This index lists the types of tabulations and data available. The Office will make every attempt to comply with requests for data within the limitations of staff and resources.

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TECHNICAL NOTES, DEFINITIONS, RATES AND RATIOS

DEFINITIONS

BIRTH WEIGHT-Weight of fetus or infant at time of delivery.

FETAL DEATH-Death prior to the complete expulsion or extraction from its mother of a product of conception, having passed through at least the 20th week of gestation or weighing at least 400 grams; the fetus shows no signs of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. (Note: This includes both spontaneous and induced terminations.)

FIRST BIRTH-A live birth where the maternal medical history indicates there were no prior live births to the mother.

GESTATIONAL PERIOD-Number of weeks elapsed between the first day of the last menstral period and the date of delivery.

HEBDOMADAL DEATH-Death occurring to an individual less than 7 days of age.

INFANT DEATH-Death occurring to an individual less than 1 year of age.

INTERPREGNANCY TIME PERIOD-Birth date minus date of last termination, whether a live birth or fetal death, in months. Time periods of zero length are dropped to exclude 2nd or higher births of multiple deliveries.

LEADING CAUSES OF DEATH-Deaths are grouped into 72 categories dependent upon the underlying cause of death. Ranks are assigned by organizing these categories according to the number of deaths in each category from most frequent to least.

LIFE EXPECTANCY-A hypothetical calculation of the average age at death for a cohort of persons subject to the age-specific mortality rates observed over a given time period.

LIFE TABLE VALUES:

nqx=The proportion of persons in the cohort alive at the beginning of an age interval (x) who will die before reaching the end of that age interval (x+n).

lx=The number of persons living at the beginning of an age interval (x) out of an original cohort of 100,000.

ndx=The number of persons who would die during an age interval (x to x+n) out of an original cohort of 100,000.

nLx=The number of person-years that would be lived within an indicated age interval (x to x+n) out of an original cohort of 100,000 alive for all or part of the interval.

Tx=The number of person-years that would be lived after the beginning of an age interval (x) by an original cohort of 100,000 until all are assumed to have died.

ex=The average remaining lifetime (in years) for an individual person who survives to the beginning of an indicated age interval (x).

LIVE BIRTH-A live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.
Effective on November 9, 1981, the definition of a live birth is established in administrative rule number 325.3201 as follows:

> "Live birth" means the complete expulsion or extraction from a pregnant woman of a product of human conception which, after such expulsion or extraction, shows any evidence of life, whether or not the umbilical cord has been cut or the placenta is attached.

LIVE-BIRTH ORDER-Order number is equal to number of previous live births plus current birth.

LOW-WEIGHT BIRTH-Birth wherein the birth weight is equivalent to 2,500 grams or less (approximately 5 lbs., 8 oz.).

MATERNAL DEATHS-Those deaths wherein the physician has designated a maternal condition as the underlying cause of death (9th Revision ICD codes 630-676).

MEAN-The average of a set of values, equal to the sum of the values divided by the number of values.

MEDIAN-The central value of a distribution of values wherein the same percentage of observations are above this point as are below.

MINOR CIVIL DIVISION-City, village, or township.

NEONATAL DEATH-Death occurring to individual less than 28 days of age.

OCCURRENCE-Place where the event actually occurred.

PERINATAL DEATH-Fetal death or death under 1 week of age.

PROBABILITY OF EVENTUALLY DYING FROM A GIVEN CAUSE OF DEATH-The chance of death due to a given cause rather than some competitive cause over the course of a lifetime based on current mortality data and life expectancy techniques.

RACE-Race for mother, father, or decedent is as stated on certificate. Race of child is determined from the race of the parents.

REMAINING YEARS OF LIFE-A hypothetical calculation of the average number of years a cohort of persons will live given that they have reached a specific age and assuming they are subject to the age-specific mortality rates observed over a given time period.

RESIDENCE-Usual place of residence for the person to whom the event occurred. For births and fetal deaths residence is defined as the mother's usual place of residence.

TOTAL BIRTHS-Live births and fetal deaths.

UNDERLYING CAUSE OF DEATH-That condition giving rise to the chain of events leading to death.

RATES AND RATIOS

AGE-ADJUSTED DEATH RATE-A summary rate of death that is developed using a standard population distribution to improve the comparability of rates for areas or population subgroups with differing age distributions. When calculated by the direct method, as in this report, age-specific death rates for a geographic area or population subgroup are multiplied by the standard population by specific age and the products summed and divided by the total standard population. Age-adjusted death rates represent the mortality experience that would have occurred in a standard population had the age-specific rates of the area or population subgroup been experienced by the standard population. These rates are presented as per 100,000 population.

AGE-SPECIFIC BIRTH RATE-No. of resident live births to women of a specific age divided by total female population of specific age x 1,000.

AGE-SPECIFIC DEATH RATE-No. of deaths in specific age group divided by total resident population in specific age group x 100,000.

AGE-SPECIFIC DEATH RATE BY CAUSE OF DEATH-No. of deaths in specific age group and from a specific cause divided by total resident population in specific age group x 100,000.

AGE-SPECIFIC MARRIAGE RATE-No. of marriages in specific age group by sex divided by total resident population in specific age and sex group x 1,000.

CAUSE-SPECIFIC RATE-No. of deaths due to a specific cause divided by total resident population x 100,000.

COMMUNICABLE DISEASE CASE RATE-No. of reported cases (specific communicable diseases) divided by total resident population x 100,000.

CRUDE BIRTH RATE-No. of resident live births divided by total resident population x 1,000.

CRUDE DEATH RATE-No. of resident deaths divided by total resident population x 1,000.

DIVORCE RATE-No. of persons (divorces and annulments) divided by total resident population x 1,000.

FERTILITY RATE-NO. of resident live births divided by total female population (ages 15-44) x 1,000.

FETAL DEATH RATE-No. of resident fetal deaths divided by total resident live births and resident fetal deaths x 1,000.

FETAL DEATH RATIO-No. of resident fetal deaths divided by total resident live births x 1,000.

FIRST MARRIAGE RATE-No. of marriages to persons not previously married by sex divided by total resident population by sex x 1,000.

INFANT MORTALITY RATE-No. of infant deaths divided by total resident live births x 1,000.

LOW-WEIGHT BIRTH RATIO-No. of low-weight births divided by total resident live births x 1,000.

MARRIAGE RATE-No. of persons married divided by total resident population x 1,000.

MATERNAL DEATH RATE-No. of maternal deaths divided by total resident live births x 10,000.

NEONATAL DEATH RATE-No. of neonatal deaths divided by total resident live births x 1,000.

NO PRENATAL CARE RATIO-No. of live births to mothers with no prenatal care divided by total resident live births x 1,000.

PERINATAL DEATH RATE-No. of perinatal deaths divided by total resident live births and resident fetal deaths x 1,000.

RATE OF NATURAL INCREASE-(Total resident live births minus total resident deaths) divided by total resident population x 1,000.

TOTAL FERTILITY RATE-Sum of (age-specific birth rates) x (number of years in age group) for each age group from ages 10-14 through 45-49 years.

RELIABILITY OF RATES

Care should be taken in drawing specific inferences from comparisons of rates for different areas or different periods of time. Rates based on a small number of events or for a small area tend to exhibit considerable variation from time period to time period or place to place. Excessive variation in rates not only negates their utility as estimators of the probability of an event occurring but also their usefulness for comparative purposes. Also, one should recognize the limitations of using unadjusted rates in attempting to attribute rate differences to particular factors. For example, one should not attempt to state that there was a significant difference in rates for two geographic areas for atherosclerosis without first adjusting the rates to negate the effects of differing age distributions in the two areas. Many times there are simply not sufficient data available to adequately adjust rates for all possible confounding factors. For this reason the reader should exercise diligence and caution while attempting to draw substantive conclusions when comparing vital statistics rates.

QUALIFICATIONS AND LIMITATIONS OF DATA AND CALCULATIONS

UNDERREGISTRATION OF EVENTS

The underregistration of vital events in Michigan is considered to be a minimal problem particularly for births and deaths. Tests of registration completeness conducted in conjunction with the 1950 Census indicate that the registration of births was 98.5 percent complete, and that death registration was even more complete. The number of certificates received too late for inclusion in annual statistical files is insignificant when examining statewide patterns.

GEOGRAPHIC ALLOCATION

The allocation of events on a residence or occurrence basis is for the most part accurate and complete. However, allocations to minor civil divisions are subject to question in some instances. In those cases where the respondent completes the residence item with a mailing address, geographic allocation is sometimes undeterminable and the record receives an unknown minor civil division code.

FETAL DEATHS

Fetal deaths in Michigan include only those conceptions that have passed through 20 weeks gestation or that weigh 400 grams or more. Prior to the introduction of a new reporting form for fetal deaths on September 30, 1978, Michigan law required only the reporting of deaths of fetuses which had passed through 20 weeks gestation. Inadequacies in determining the gestational age of the fetus may have resulted in some underreporting of fetal deaths. The change in definition has had little impact on the number of fetal deaths reported.

COMPARABILITY IN CAUSE OF DEATH STATISTICS

The reader should bear in mind two major limitations in interpreting changes in cause-of-death statistics. Changes in nomenclature and the classification scheme (International Classification of Diseases) and changes in diagnostic practices may seriously affect the comparability of such statistics over time. The classification scheme (ICD) is modified approximately once every ten years to reflect changing medical opinion and practice. The reader is most accurate when comparing cause-of-death certificates which are coded via one revision of the International Classification of Diseases and utilizing the coding practices and procedures in effect at that time.

In order to compare cause-of-death statistics from one revision to the next it is necessary to apply a 'comparability ratio'. Such ratios are developed by comparing the number of deaths assigned to a certain condition or group of conditions under one revision to the number assigned under another revision of the ICD.

In 1979 the 9th Revision of the International Classification of Diseases, WHO, was introduced for coding causes of death and was employed in categorizing the data for 1981.

LIFE EXPECTANCY

The procedure used to obtain the Michigan life table values is called the iterative method. This is a method which has been developed by Professor Felix Moore of the Department of Biostatistics, School of Public Health, University of Michigan.

For the age group 0-1 the method utilizes the algorithm developed by Greville with no iteration. For all subsequent age groups the method of Greville (Keyfitz) is used with three iterations to improve the estimate of ndx and nqx. An iteration procedure is also used for nLx for age groups 75-80 and 80-85 where the accuracy of mortality information is a factor and for obtaining the separation factor for the age group 1-4.

The life expectancy data by region shown in Figure 4.7 was prepared using mortality data for the period 1979-1981 and census population data for 1980. Data were grouped by ten year age groups (except for the age groups under 1 year and 1-4 years) to compute the life expectancy at birth for the regions.

AGE-ADJUSTMENT PROCEDURE AND POPULATION ESTIMATION

Population data for 1970 and 1980 were obtained from the April 1, 1970 and April 1, 1980 census counts. Data for 1980 included estimates derived from a provisional census release of the distribution by age, race, and sex, as well as some final counts by age and sex. The population totals used for 1971-1979 are intercensal estimates prepared by the Census Bureau utilizing the 1980 census results. The breakdowns of these totals by age, race, and sex were prepared by the Office of Vital and Health Statistics. For 1970 and 1980 the proportion of the total population in each age, race, and sex group was computed. Estimates of the proportion of the total population in each age, race, and sex group for the years 1971-1979 were then derived by interpolating between the proportions for 1970 and 1980. These subgroup proportions were then applied to the state totals to obtain population estimates by age, race, and sex for years 1971-1979.

Population estimates by age and sex for 1981 were provided by the Michigan Department of Management and Budget, Office of the Budget. Race estimates were prepared by the Department of Public Health, Office of Vital and Health Statistics, by projecting the mean annual change in the race proportions of each age-sex group of the population observed between the 1970 and 1980 censuses.

The age-adjusted rates for Michigan presented in this report for years 1970-1981 were calculated using Michigan resident mortality data and the series of population data described above. Death records with the race not stated were first randomly allocated to the white and other than white groups based on the proportion of Michigan resident deaths in each of the racial categories for that year. Records with sex not stated were randomly assigned to male and female (50 percent each). Records with age not stated were allocated to the age group 85 and over.

In the age-adjustment procedure ten age groups were employed including under 1 year, 1-14 years, ten year age groups from 15-24 years to age 75-84, and 85 years and over. Age-specific rates for the total population and for each subgroup were applied to the same standard population distributed by age. The resulting "expected deaths" were then summed over the ten age groups and divided by the total of the standard population to obtain the age-adjusted rate. The standard population selected was the 1940 United States enumerated population. Comparisons can be made between subgroup rates, between rates in different years, and between rates for Michigan and similarly computed rates for the United States.

UNITED STATES DEATH RATES

Death rates for the United States were taken from publications by the National Center for Health Statistics, U.S. Dept. of Health and Human Services. Rates for the United States shown in the series of tables of age-adjusted death rates for Michigan and the United States are based on the series of population estimates prepared before the results of the 1980 census enumeration were available. Because the rates are based on population estimates which are consistent with one another, trend comparisons for the nation can be made for the period 1970-1980. The U.S. rates for 1971-1980 will be revised as a result of the large difference between the 1980 census enumeration and the previously estimated population for 1980. The 1980 census enumeration was about 5.5 million higher than the estimated population for April 1, 1980.

The unadjusted death rates for the U.S. for all causes and by cause for 1980 and 1981 quoted in the text and shown in Tables 2.1 and 2.7 were calculated using population estimates based on the 1980 census enumeration.

NATALITY

SECTION I

NATALITY: AN OVERVIEW, 1981

TOTAL RESIDENT BIRTHS	141,662
TOTAL RESIDENT LIVE BIRTHS	140,579
RESIDENT LIVE BIRTHS PER DAY	385.1
TOTAL RESIDENT FETAL DEATHS	1,083
RESIDENT FETAL DEATHS PER DAY	3.0
CRUDE BIRTH RATE	15.2
FERTILITY RATE	63.3
FETAL DEATH RATIO	7.7
FIRST ORDER BIRTHS (PERCENT OF TOTAL LIVE BIRTHS)	42.0
MEDIAN BIRTH WEIGHT IN GRAMS (LIVE BIRTHS)	3,400
MEDIAN BIRTH WEIGHT IN GRAMS (FETAL DEATHS)	1,332
LOW WEIGHT LIVE BIRTHS	9,752
LOW WEIGHT BIRTH RATIO	69.4
MEDIAN AGE OF MOTHER (LIVE BIRTHS)	25
MEDIAN AGE OF MOTHER (FETAL DEATHS)	25
LIVE BIRTHS WITH CONGENITAL ANOMALIES	1,135
CONGENITAL ANOMALIES PER 10,000 LIVE BIRTHS	80.7
LIVE BIRTHS WITH NO PRENATAL CARE	930
NO PRENATAL CARE RATIO	6.6
HOME BIRTHS	646
LIVE BORN SETS OF TWINS	1,375
LIVE BORN SETS OF TRIPLETS	21
LIVE BORN MULTIPLE BIRTHS OF FOUR OR MORE	-
MALE LIVE BIRTHS PER 100 FEMALE LIVE BIRTHS	104.8

Between 1900 and 1981 the number of total births has varied considerably. The general trend has been increasing numbers of total births from 1900 through 1957 and declining numbers since that time. According to the annual enumeration of births by local officials in 1900 there were 45,024 total births in Michigan. This figure dropped slightly to 44,722 in 1901 (the lowest total in the century). The number of total births reported increased significantly with the initiation in 1906 of mandatory filing of individual certificates for each Michigan birth. Total births increased during the next two decades, dropped temporarily in 1919, and then leveled off at just over 100,000 between 1924 and 1930. During the first years of the Great Depression, total births declined from 102,596 in 1930 to 83,258 in 1933. Then from 1933 to 1957, excluding the war years of 1944 and 1945, total births increased to a century high peak of 211,642 in 1957. Total births in the next two decades dropped to a post-World War II low of 132,642 in 1976. In each of the following four years, the number of total births increased, reaching 146,338 in 1980. In 1981 the number declined to 141,662 (Table 1.1).

LIVE BIRTHS

The smallest number of live births officially recorded in this century was 43,221 in 1901. The actual number of live births was undoubtedly higher, as a significant percentage of births were not recorded prior to 1906. Figure 1.1 portrays the number of live births for Michigan from 1900 through 1981. Live births, which constitute a large percentage of total births, naturally followed the same pattern of increases and decreases, rising appreciably from 43,699 in 1900 to 208,488 in 1957, the peak year for this century. Between 1957 and 1976, live births decreased by 37 percent to 131,378, the lowest total in 31 years. In 1977, however, live births increased by 5.4 percent, the largest such increase since 1951. In each of the following three years the number of live births also increased. In 1980 there were 145,162 live births, the highest annual total since 1972. In 1981 the number of live births declined by 3.2 percent to 140,579.

The national pattern is similar to that observed in Michigan. Live births increased from an estimated 2,718,000 in 1909 to an estimated 4,300,000 in 1957. Since 1957, there has been a general decline in live births. The low point occurred in 1973 when live births in the United States totaled 3,136,965. The number of live births for the nation has increased in each of the last six years. For 1981 the provisional figure was 3,646,000, an increase of 1.3 percent from the provisional number for 1980.

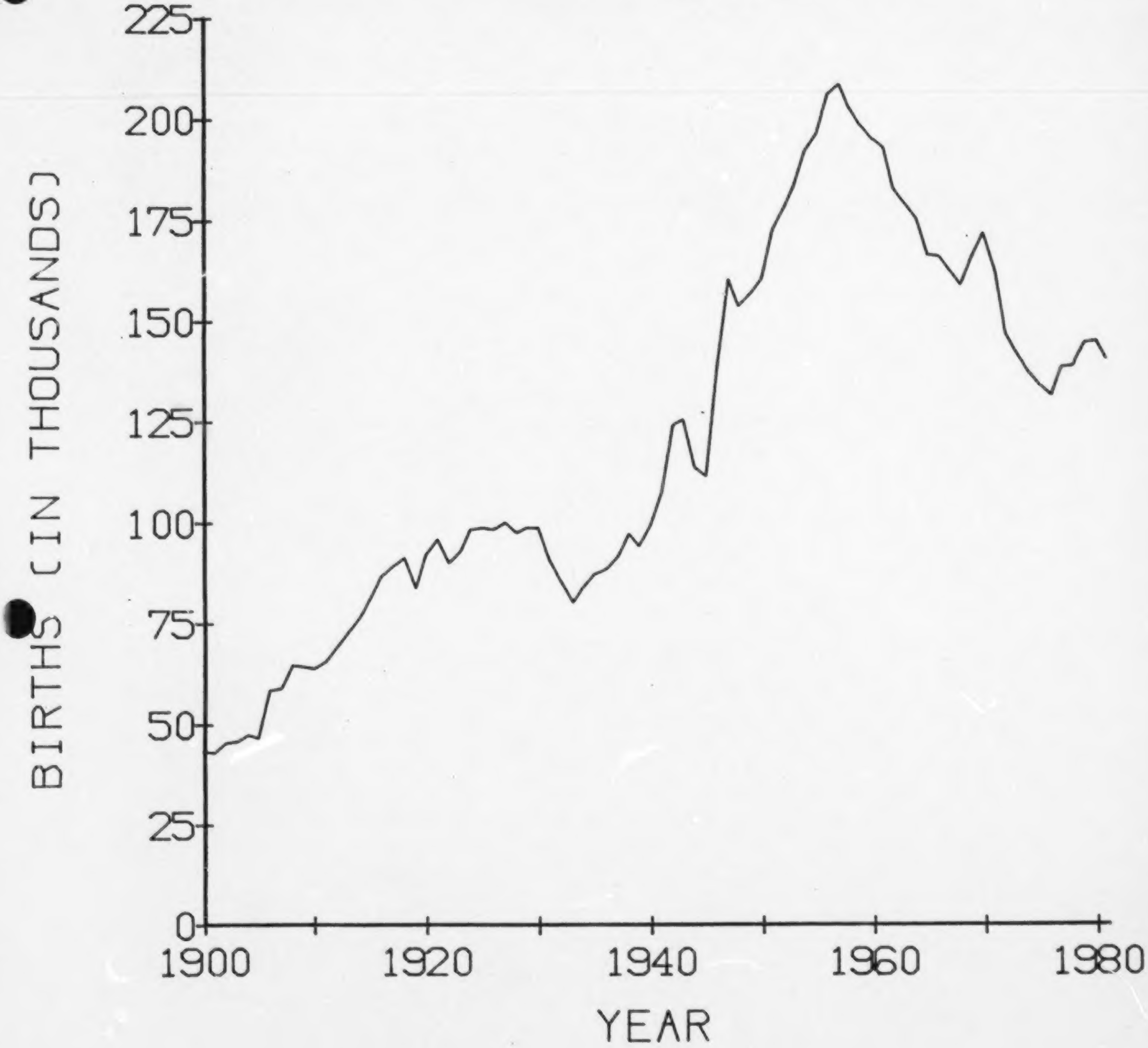
Another view of the historic pattern in live births may

Table 1.1
Total Births, Michigan Residents, Selected Years, 1900-1981

YEAR	TOTAL BIRTHS
1900	45,024
1901	44,722
1910	66,668
1920	96,015
1930	102,596
1933	83,258
1940	101,708
1950	163,150
1957	211,642
1960	198,064
1970	173,727
1971	164,167
1972	148,624
1973	143,232
1974	138,852'
1975	135,287'
1976	132,642'
1977	139,700'
1978	140,020'
1979	145,668
1980	146,338
1981	141,662

'Revised.

FIGURE 1.1 LIVE BIRTHS, MICHIGAN RESIDENTS, 1900-1981



be obtained through examination of changes in the crude birth rate. By considering population size the historic pattern of live births is stabilized (Figure 1.2). The crude birth rate in Michigan ranges from a low of 14.4 in 1976 to a high of 27.4 in 1956. The crude birth rate increased from 22.1 in 1906, the first year for filing birth certificates, to 26.2 in 1916. During the period 1917 to 1933 Michigan's crude birth rate declined steadily, reaching 16.2. The birth rate rose over the next 23 years to a peak in 1956 (27.4). Between 1956 and 1976 Michigan's crude birth rate declined by 47 percent, falling to 14.4. By 1980 the crude birth rate had increased to 15.7. In 1981 the crude birth rate declined by 3.2 percent to 15.2.

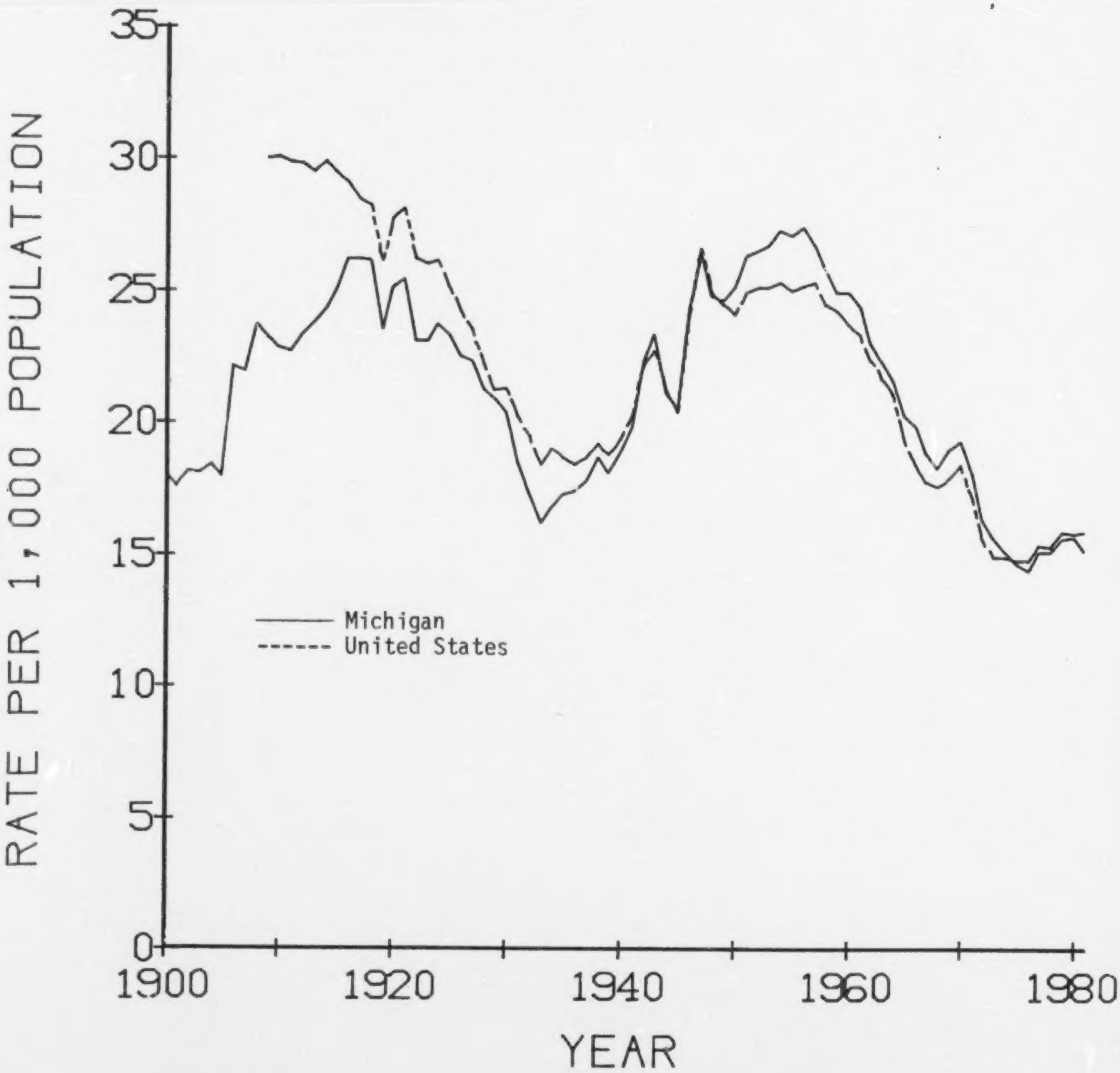
National statistics follow the same general pattern of rising and falling as observed in Michigan. The highest rate observed nationally over the period 1909 through 1981 was 30.1 in 1910, while the lowest was 14.8, occurring in both 1975 and 1976. United States live birth rates were above those observed in Michigan without exception from 1909 to 1941. Between 1942 and 1947, national rates were above those for the state twice. National birth rates were below Michigan rates from 1948 through 1974. For the past seven years the rate for the nation has been above that observed in Michigan. In 1981 the provisional rate for the United States was 15.9 (Table 1.2).

FERTILITY

The crude birth rates examined above are useful statistics for gauging overall trends in live births for specific geographic areas. Where attempts are made to interpret such trends, however, crude birth rates can be misleading. These rates do not incorporate specifically the size of the population capable of bearing children. This population subset, generally considered to be women between the ages of 15 through 44, does not always maintain a stable relationship with the total population. A measure for analyzing changing birth patterns that is more exact is the fertility rate. Since the fertility rate relates the number of live births to the female population of childbearing age, valid comparisons for various periods of time and various locations are possible.

A comparison of fertility rates for Michigan with those for the United States is presented in Table 1.3. The crude birth rate changes observed understate the recent decline in fecundity for both regions. Since 1960 the crude birth rate in Michigan has dropped 39.0 percent, while the fertility rate in 1981 was 48.6 percent below the 1960 rate. For the United States over this same period the crude birth rate declined 32.9 percent and the fertility rate fell by 42.7 percent. The proportion of the population in the

FIGURE 1.2 LIVE BIRTHS RATES, MICHIGAN RESIDENTS, 1900-1981 AND UNITED STATES RESIDENTS[1], 1909-1981



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[1] U.S. rates prior to 1909 are not available. U.S. 1980 and 1981 figures are provisional.

Table 1.2
Live Births and Crude Birth Rates, Michigan and United States Residents, Selected Years, 1900-1981

UNITED STATES		YEAR	MICHIGAN	
LIVE BIRTHS	RATE		LIVE BIRTHS	RATE
N.A.	N.A.	1900	43,699	18.1
2,777,000	30.1	1910	64,109	22.8
2,950,000	27.7	1920	92,245	25.1
2,618,000	21.3	1930	98,882	20.4
2,559,000	19.4	1940	99,106	18.9
3,632,000	24.1	1950	160,055	25.1
4,257,850	23.7	1960	195,056	24.9
4,268,326	23.3	1961	192,825	24.4
4,167,362	22.4	1962	182,790	23.0
4,098,020	21.7	1963	178,871	22.3
4,027,490	21.0	1964	175,103	21.6
3,760,358	19.4	1965	166,464	20.3
3,606,274	18.4	1966	165,794	19.9
3,520,959	17.8	1967	162,756	18.9
3,501,564	17.5	1968	159,058	18.3
3,600,206	17.8	1969	165,760	19.0
3,731,386	18.4	1970	171,667	19.3
3,555,970	17.2	1971	162,244	18.1
3,258,411	15.6	1972	146,854	16.3
3,136,965	14.9	1973	141,550	15.6
3,159,958	14.9	1974	137,414	15.1
3,144,198	14.8	1975	133,931	14.7
3,167,788	14.8	1976	131,378	14.4
3,326,632	15.4	1977	138,416	15.1
3,333,279	15.3	1978	138,802	15.1
3,494,398	15.9	1979	144,452	15.6
3,598,000Pr.	15.8Pr.[1]	1980	145,162	15.7
3,646,000Pr.	15.9Pr.	1981	140,579	15.2

[1] The rate for 1980 for the United States was revised using a population estimate based on the 1980 census enumeration.

Table 1.3
Fertility Rates, Michigan and United States Residents, Selected Years, 1900-1981

UNITED STATES	YEAR	MICHIGAN
---	1900	78.5
126.8	1910	99.0
117.9	1920	111.6
89.2	1930	87.6
79.9	1940	78.9
106.2	1950	110.5
118.0	1960	123.1
117.2	1961	119.0
112.2	1962	110.8
108.5	1963	106.6
105.0	1964	102.6
96.6	1965	95.9
91.3	1966	94.0
87.6	1967	90.8
85.7	1968	87.3
86.5	1969	89.6
87.9	1970	91.7
81.8	1971	84.5
73.4	1972	75.1
69.2	1973	71.2
68.4	1974	68.0
66.7	1975	65.5
65.8	1976	63.5
67.8	1977	65.9
66.6	1978	65.0
68.5	1979	66.6
67.7Pr.[1]	1980	66.3
67.6Pr.	1981	63.3

[1] The rate for 1980 for the United States was revised using a population estimate based on the 1980 census enumeration.

childbearing ages has increased over this 20 year period.

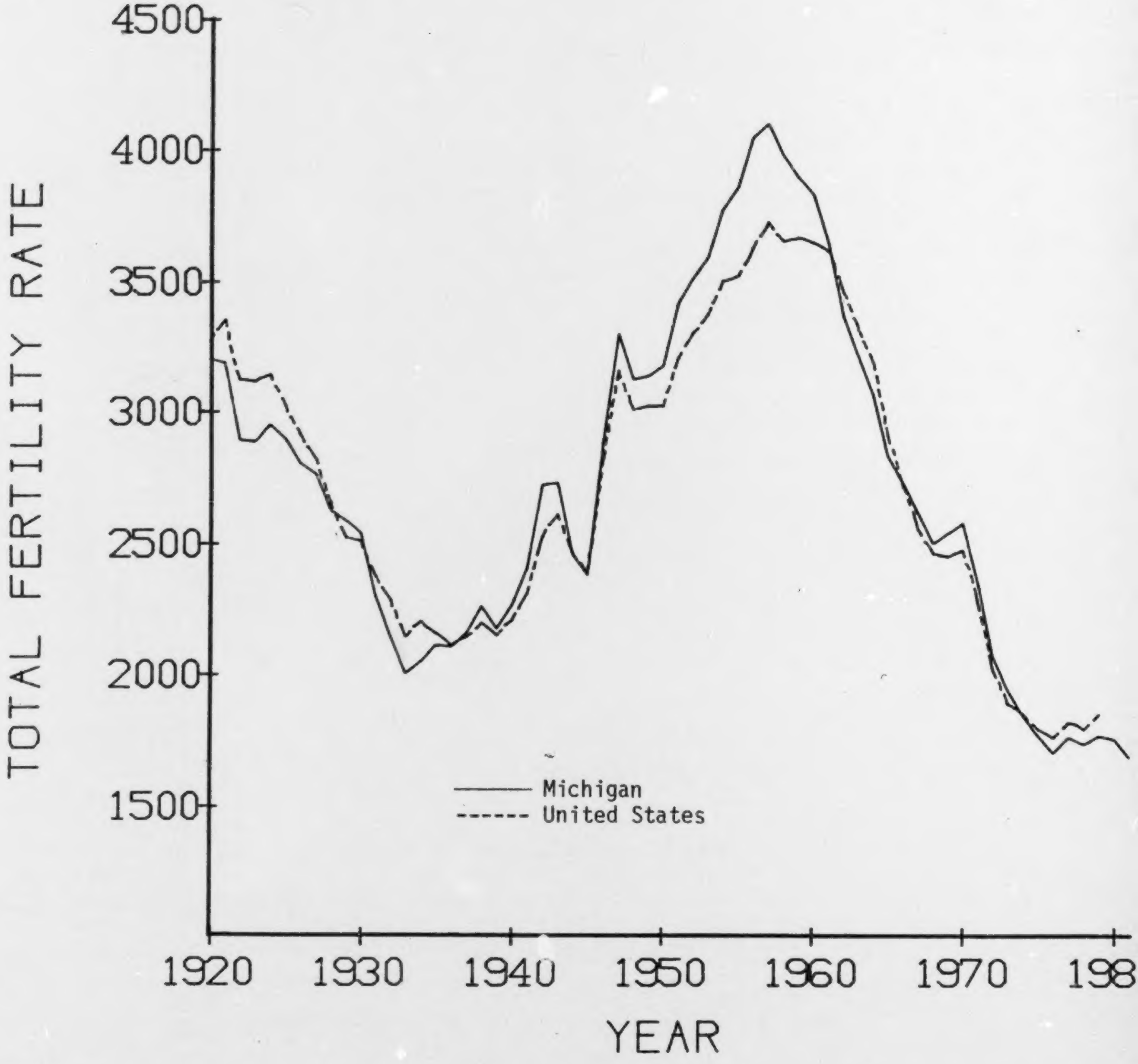
Figure 1.3 displays the changes in the total fertility rate between 1920 and 1981 for Michigan and the United States (see also Table 4.4). The total fertility rate is a hypothetical measure of the number of live births that would occur to each 1,000 women during their reproductive life, if these women experienced the age-specific birth rates observed in a given year. Michigan's total fertility rate has generally paralleled that of the nation. The Michigan rate dropped from 3,195.5 in 1920 to 2,006.5 in 1933 and then increased between 1933 and 1957, reaching 4,100.0 in the latter year. Between 1957 and 1976 the total fertility rate in Michigan declined to a low of 1,709.5 in 1976. The rates for the following four years were slightly higher. In 1981 a new record low total fertility rate (1,690.0) was observed for Michigan. The rate was 1,856.4 in 1979 for the United States.

Since 1973 both Michigan and national total fertility rates have been below 2,000. A total fertility rate of over 2,000 is necessary for replacement of the parents since not all women survive the reproductive years nor do all children survive to adulthood. If the total fertility rate falls below 2,000 for a long period, a natural decrease in population will eventually result. It should be noted that although the total fertility rate has been below 2,000 since 1973 the rate of natural increase for Michigan remains positive. Over the period 1973 through 1981 there were 573,490 persons added to the population of Michigan through the excess of births over deaths.

RACIAL COMPOSITION

In the period 1970 through 1981, the racial composition of live births in Michigan changed. Live births of white persons declined from 83.8 percent of all live births in 1970 to 81.2 percent in 1973. By 1981 this percent had increased to 82.5. Live births of black persons increased from 15.7 percent of the total in 1970 to 18.2 percent in 1973. Between 1973 and 1981 this percent declined to 16.2. Live births of all other races increased from 0.4 percent in 1970 to 1.3 percent in 1981. It should be noted that Indians from India were classified as white before 1978 and among other races since 1978. In absolute terms, the numbers of births of black and white infants declined between 1970 and 1976, with an especially sharp decline observed in births of white infants between 1970 and 1972. Between 1976 and 1980 the numbers of live births of white and black infants increased by 10.4 percent and 8.0 percent respectively. In 1981 the number of live births of white infants declined by 2.6 percent and the number of live births of black infants declined by 5.9 percent. The number

FIGURE 1.3 TOTAL FERTILITY RATES[1], MICHIGAN AND UNITED STATES RESIDENTS, 1920-1981[2]



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[1] Total fertility rate is total children to 1,000 women in their lifetime assuming constant live birth rates.

[2] 1980 and 1981 data for U.S. are not available.

of live births of American Indians and Filipinos increased between 1970 and 1981, as did those in the category of other races (Table 1.4).

Table 1.5 provides a comparison between crude birth rates and fertility rates for whites and other races in Michigan for the period since 1970. In 1970 the crude birth rate for other than white persons was 44.6 percent above that for whites. By 1972, this percentage had increased to 57.9 percent. In 1974, the percent dropped sharply to 42.3, and by 1981 it had fallen to 16.2. Paralleling the trends in numbers of live births, the crude birth rates for both groups declined between 1970 and 1976. Between 1976 and 1980 the crude birth rate for white persons increased by 10.2 percent, while that for other than white persons remained essentially unchanged. In 1981 the crude birth rates for white and other than white persons declined by 2.0 percent and 7.5 percent,respectively. The crude birth rate for white persons in 1981 was 19.6 percent below that observed in 1970 while the rate for the other than white group was 35.3 percent below the rate for 1970.

The fertility rates contained in Table 1.5 reveal that there are important differences in population structure for white persons compared to those of all other races. By comparing live births to the respective numbers of women aged 15-44 for these two groups, the relative differences in rates decrease. The fertility rate for other than white persons was 33.1 percent above the rate for white persons in 1970 and 8.8 percent higher in 1981. Since 1970 the fertility rate for other than white persons has declined 42.0 percent compared with a 29.1 percent drop for white persons.

AGE OF MOTHER

In 1981 47.3 percent of all live births were to women less than 25 years of age. Only 0.5 percent occurred to women 40 or more years of age. The median age of mothers was 25 years. Mothers of other than white infants were younger (median 23 years) than mothers of white children (median 25 years). Approximately 57 percent of the other than white infants were born to women aged 24 or less compared to 45.2 percent of the white infants. This differential is the result of the relatively large percentage of other than white live births to women at ages 15-19 (Table 1.6).

The total number of live births declined by 13.4 percent between 1971 and 1981 (Table 1.7). The largest relative declines occurred in the age groups over 34 and under 20. The age group 20-24 also experienced a decline (23.5 percent) greater than that for women of all ages. The

Table 1.4
Live Births by Infant's Race[1] or National Origin, Michigan Residents, 1970-1981

YEAR	TOTAL ALL RACES	WHITE	BLACK	AMER-ICAN INDIAN	CHINESE	FILI-PINO	OTHER[2]
1970	171,667	143,871	26,957	299	151	91	188
1971	162,244	134,165	27,245	313	135	101	177
1972	146,854	119,787	26,215	316	124	109	197
1973	141,550	114,878	25,741	302	124	121	187
1974	137,414	112,474	23,328	270	116	144	244
1975	133,931	109,718	23,224	294	151	138	226
1976	131,378	107,907	22,349	368	169	166	243
1977	138,416	114,042	23,195	431	157	153	276
1978	138,802	114,217	23,025	377	185	148	672
1979	144,452	118,671	24,010	435	150	160	820
1980	145,162	119,103	24,127	481	197	174	891
1981	140,579	115,972	22,705	526	190	140	942

[1] Births of unknown race included in total only. Persons of Spanish or of Mexican-American descent are included with white.

[2] Includes Japanese, Hawaiian, other Asian or Pacific Islander. Indians from India were counted as "White" from 1970-1977, and with "Other" since 1978.

Table 1.5
Crude Birth Rates and Fertility Rates by Race,[1] Michigan Residents, 1970-1981

CRUDE BIRTH RATE		YEAR	FERTILITY RATE	
WHITE RACE	ALL OTHER RACES		WHITE RACE	ALL OTHER RACES
18.4	26.6	1970	88.0	117.1
17.0	25.7	1971	80.3	111.4
15.2	24.0	1972	70.7	102.7
14.5	22.8	1973	67.0	96.8
14.2	20.2	1974	64.8	84.7
13.9	19.6	1975	62.7	81.6
13.7	18.5	1976	61.2	76.5
14.5	18.7	1977	63.9	76.6
14.5	18.4	1978	63.2	74.5
15.1	18.7	1979	64.8	75.4
15.1	18.6	1980	64.6	74.5
14.8	17.2	1981	62.4	67.9
-19.6	-35.3	Percent Change, 1970-1981	-29.1	-42.0

[1] Births of unknown race are excluded.

Table 1.6
Live Births and Percent Distribution by Age of Mother and Race of Child, Michigan Residents, 1981

AGE OF MOTHER	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Under 15 Years	300	0.2	97	0.1	202	0.8	1	1.0
15-19 Years	18,397	13.1	12,959	11.2	5,420	22.1	18	17.3
20-24 Years	47,737	34.0	39,379	34.0	8,320	34.0	38	36.5
25-29 Years	46,527	33.1	40,217	34.7	6,283	25.6	27	26.0
30-34 Years	22,178	15.8	18,920	16.3	3,241	13.2	17	16.3
35-39 Years	4,701	3.3	3,818	3.3	880	3.6	3	2.9
40 or More Years	729	0.5	573	0.5	156	0.6	-	-
Not Stated	10	0.0	9	0.0	1	0.0	-	-
Total	140,579	100.0	115,972	100.0	24,503	100.0	104	100.0
Median Age at Last Birthday	25	000	25	000	23	000	24	000

Table 1.7
Live Births and Population of Women by Age,
Michigan Residents, 1971 and 1981

AGE GROUP	LIVE BIRTHS			POPULATION ESTIMATES		
	1971	1981	PERCENT CHANGE	1971	1981	PERCENT CHANGE
Under 20 Years[1]	28,952	18,697	-35.4	439,858	431,341	-1.9
20-24 Years	62,367	47,737	-23.5	385,592	453,023	+17.5
25-29 Years	43,639	46,527	+6.6	314,811	414,940	+31.8
30-34 Years	18,258	22,178	+21.5	264,095	382,389	+44.8
35-39 Years	6,975	4,701	-32.6	250,164	295,501	+18.1
40 and Over[2]	2,039	729	-64.2	266,631	243,582	-8.6
All Ages[3]	162,244	140,579	-13.4	1,921,151	2,220,776	+15.6

[1] Population shown is for females 15-19.

[2] Population shown is for females 40-44.

[3] Population shown is for females 15-44. Live births with age not stated are included only in the total.

number of live births to women 25-29 was 6.6 percent higher in 1981 than in 1971, while there was a 21.5 percent increase in live births to women 30-34 years of age over the decade.

Table 1.7 also provides the age distribution of the childbearing population in 1971 and 1981. Between these years the number of women aged 15-44 years increased by 15.6 percent. The largest relative increase in population occurred in the age group 30-34, the age group with the greatest increase in live births between 1971 and 1981. The only groups to experience population declines were the 15-19 and 40-44 year age groups.

AGE-SPECIFIC LIVE BIRTH RATES

As displayed in Table 1.8, a substantial reduction in the age-specific birth rates for Michigan females across all age groups has occurred since 1971. The greatest relative decreases in birth rates between 1971 and 1981 were for women over 34 years of age. Birth rates for women under age 25 also declined more than did the birth rate for women of all ages. The decline in the birth rate for women 30-34 years old was 16.1 percent, the smallest decrease observed for any age interval.

Figure 1.4 displays age-specific live birth rates for the period 1970-1981. Birth rates in all age groups dropped between 1970 and 1976. For women under 20 years the birth rate continued to decline throughout the years 1976-1981. Between 1976 and 1980 birth rates for women in the age groups 30-34 and 35-39 increased by 24.5 percent and 9.3 percent respectively while the birth rates for women between 20 and 29 years of age and those over 39 years remained stable. In 1981 the birth rate declined in all age groups, with the largest decline occurring in the 20-24 year age group (6.8 percent).

In 1970, women aged 20-24 had the highest birth rate of any age group, 14.3 percent higher than that of women aged 25-29. In 1976, 1979, 1980, and 1981 the birth rate of women in the 25-29 year age group was above that of women aged 20-24. In 1981 the birth rate for the 25-29 year age group was 6.4 percent higher (Table 4.4).

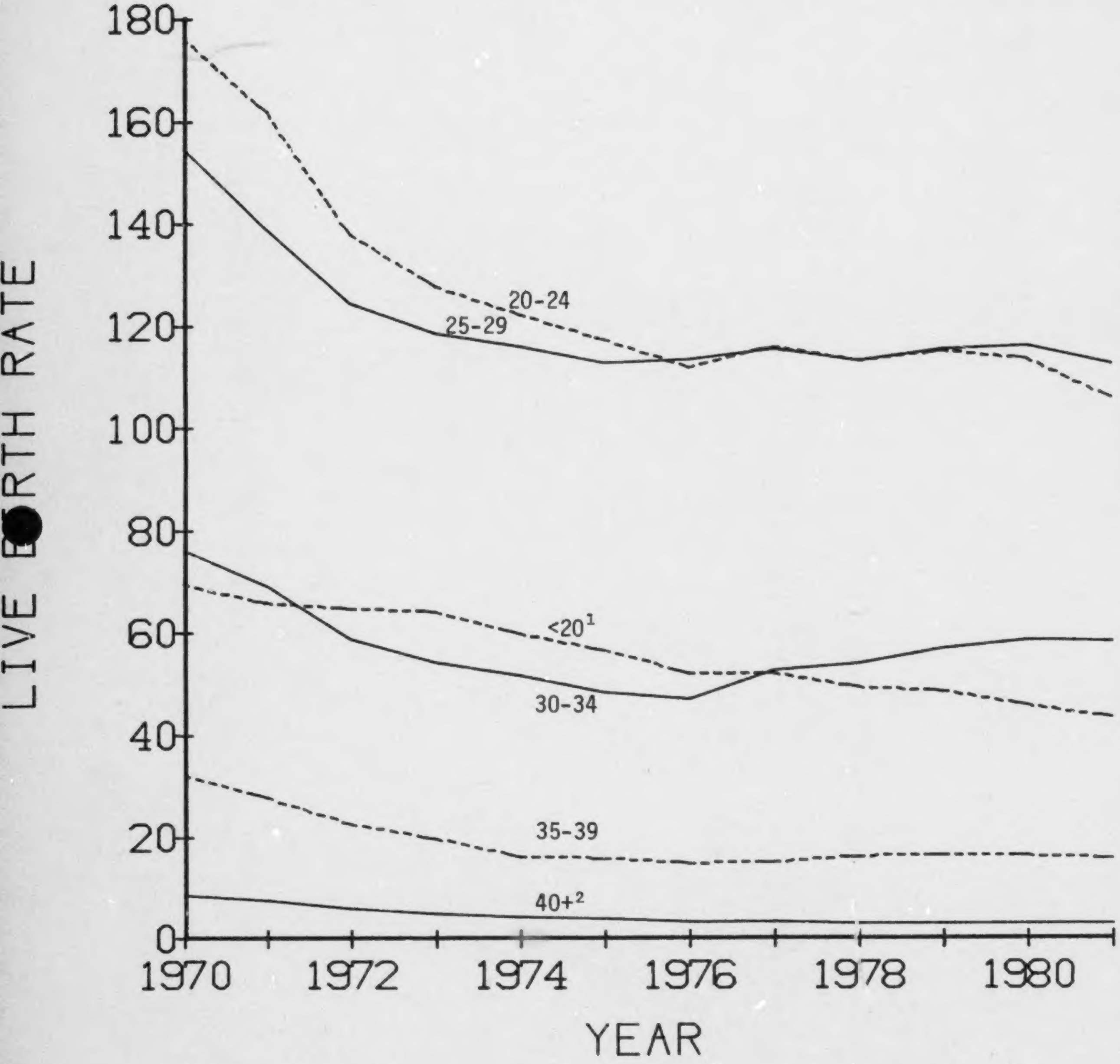
Table 1.8 displays age-specific live birth rates for white women and women of all other races for the years 1971 and 1981. Generally, rates for other than white women were above those for white women. However, the live birth rate for white women between 25 and 29 years exceeded that for other than white women by 3.7 percent and 35.4 percent respectively in 1971 and 1981. In 1981 the rate for white women between 30 and 34 years also exceeded that for their

Table 1.8
Age-Specific Live Birth Rates by Race, Michigan Residents, 1971 and 1981

AGE GROUP	RACE[1]								
	TOTAL			WHITE			ALL OTHER[1]		
	1971	1981	PERCENT CHANGE IN RATE	1971	1981	PERCENT CHANGE IN RATE	1971	1981	PERCENT CHANGE IN RATE
Under 20[2] Years	65.8	43.3	-34.2	53.8	36.2	-32.7	145.1	79.4	-45.3
20-24 Years	161.7	105.4	-34.8	157.2	104.1	-33.8	190.0	111.4	-41.4
25-29 Years	138.6	112.1	-19.1	139.2	117.4	-15.7	134.2	86.7	-35.4
30-34 Years	69.1	58.0	-16.1	68.4	59.5	-13.0	73.5	50.4	-31.4
35-39 Years	27.9	15.9	-43.0	26.7	15.2	-43.1	35.6	20.0	-43.8
40 or Over[3]	7.6	3.0	-60.5	7.1	2.7	-62.0	11.8	4.5	-61.9
Total[4]	84.5	63.3	-25.1	80.3	62.4	-22.3	111.4	67.9	-39.0

[1] Data on race not stated are included only in the total columns.
[2] Age-specific birth rates for under 20 are based on female population 15-19.
[3] Age-specific birth rates for 40 and over are based on female population 40-44.
[4] Total birth rates (fertility rates) are based on female population 15-44.

FIGURE 1.4 AGE-SPECIFIC LIVE BIRTH RATES, MICHIGAN RESIDENTS, 1970-1981



[1] Based on live births to women under 20 and population of females 15-19.

[2] Based on live births to women 40 or over and population of females 40-44.

other than white counterparts (18.1 percent). Live birth rates declined over these ten years across all ages for both racial categories. The largest relative decreases in these rates were experienced by women of both racial groups who were 35 years or older and by other than white women under 20 years of age. The smallest declines were for white women aged 25-34.

BIRTH ORDER

The percent of live births which are first order births is displayed in Figure 1.5 for Michigan and the United States for the period since 1960. Between 1960 and 1970, the percent of first order births increased from 22.9 to 37.4 in Michigan and by 1980 the percent had increased to 42.4. However, the number of first births declined by 15.9 percent between 1970 and 1976 (Table 1.9). Between 1976 and 1980 the number of first births increased 13.9 percent. In 1981 the decline in the number of first births (3.9 percent) exceeded the decline in total live births (3.2 percent). The trend in first births has been similar for the United States.

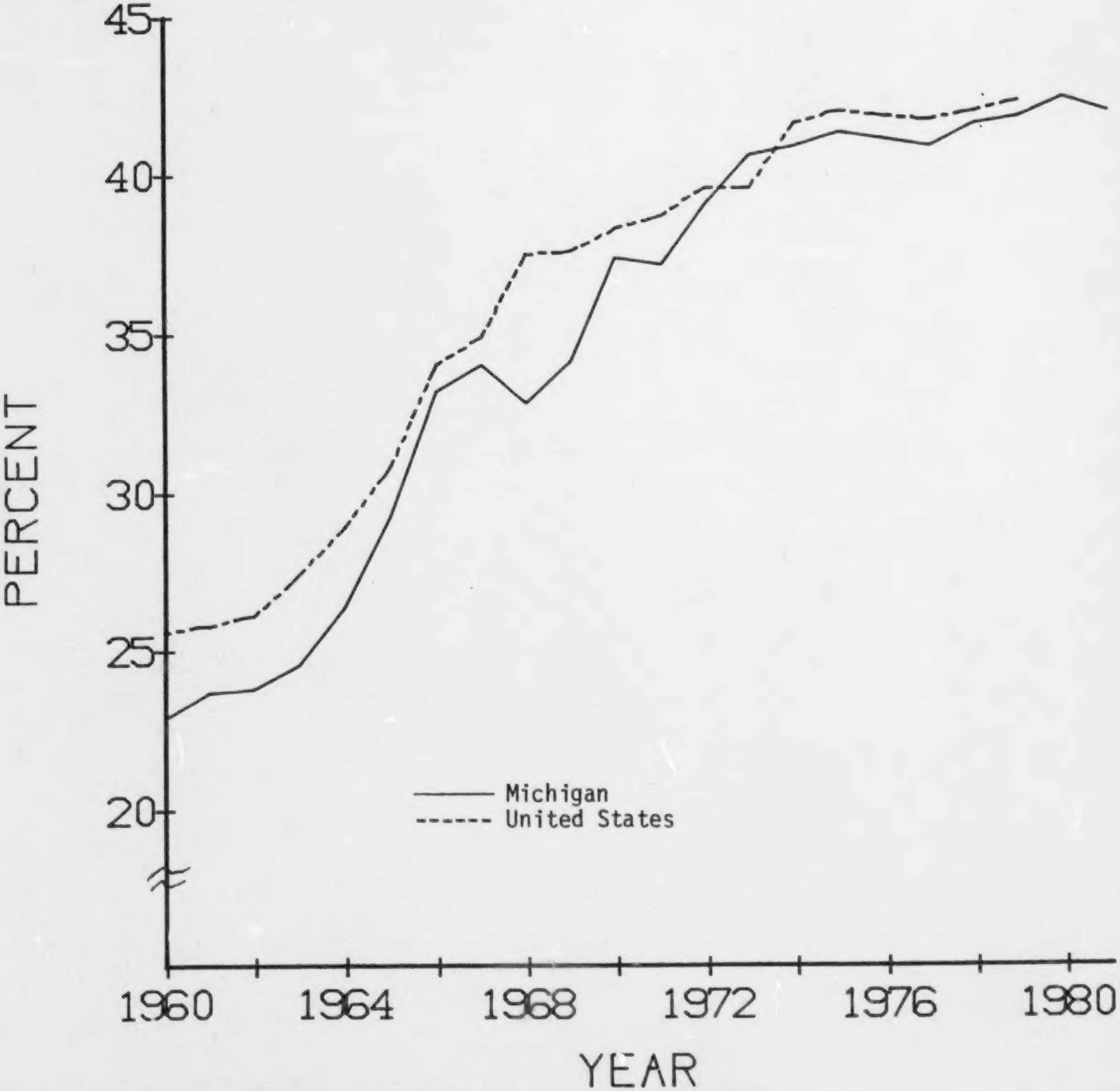
The distribution of Michigan resident live births by live birth order is displayed in Tables 1.10 and 1.11 for the years 1971 and 1981. There has been a considerable shift in recent years toward smaller families. First and second order live births comprised 65.5 percent of all live births in 1971 and 74.4 percent in 1981. On the other hand, 18.2 percent of all live births in 1971 were fourth or higher order live births. In 1981 the figure was 9.2 percent. The greatest relative decline occurred in fifth or higher order live births. These constituted 9.7 percent of all live births in 1971 compared to 3.4 percent in 1981.

Within each age group first and second order births comprised a greater percent of all births in 1981 than in 1971, with the more pronounced shifts occurring in the age groups of older women. For women 30-39 years of age first and second order births comprised 23.0 percent of all births in 1971 and 49.6 percent in 1981. In 1981 33.0 percent of all live births to women 25-29 years of age were first births, compared to 19.9 percent in 1971.

The median age of mothers having their first child increased from 21 to 22 between 1971 and 1981. For mothers having their second child, the median age increased from 23 to 25. The median ages for mothers having their third or fourth child each increased by one year between 1971 and 1981.

First births to women 25 years of age or older comprised 17.9 percent of all first births in 1971 and 34.5

FIGURE 1.5 FIRST BIRTHS AS A PERCENTAGE OF ALL LIVE BIRTHS, MICHIGAN AND UNITED STATES RESIDENTS, 1960-1981[1]



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[1] 1980 and 1981 data for the U.S. are not available.

Table 1.9
First Births, Michigan and United States Residents, Selected Years, 1960-1981

UNITED STATES		YEAR	MICHIGAN	
FIRST BIRTHS	PERCENT OF ALL BIRTHS		FIRST BIRTHS	PERCENT OF ALL BIRTHS
1,090,152	25.6	1960	44,711	22.9
1,157,386	30.8	1965	48,660	29.2
1,430,680	38.3	1970	64,222	37.4
1,375,668	38.7	1971	60,413	37.2
1,289,257	39.6	1972	57,477	39.1
1,243,358	39.6	1973	57,411	40.6
1,314,194	41.6	1974	56,233	40.9
1,319,126	42.0	1975	55,348	41.3
1,324,811	41.8	1976	54,003	41.1
1,387,143	41.7	1977	56,622	40.9
1,401,491	42.0	1978	57,767	41.6
1,479,260	42.3	1979	60,424	41.8
---	---	1980	61,516	42.4
---	---	1981	59,105	42.0

Table 1.10
Live Births by Live Birth Order and Age of Mother, Michigan Residents, 1971

LIVE BIRTH ORDER	AGE OF MOTHER							
	UNDER 20 YEARS	20-24 YEARS	25-29 YEARS	30-39 YEARS	40 OR MORE YEARS	NOT STATED	ALL AGES	MEDIAN AGE AT LAST BIRTHDAY
First Birth	22,752	26,812	8,693	2,071	79	6	60,413	21
Second Birth	5,190	23,241	13,590	3,720	95	3	45,839	23
Third Birth	849	8,684	11,354	5,227	249	2	26,365	26
Fourth Birth	113	2,628	5,896	4,913	248	1	13,799	28
Fifth Birth or Greater	21	957	4,089	9,286	1,368	2	15,723	32
Not Stated	27	45	17	16	-	-	105	22
All Birth Orders	28,952	62,367	43,639	25,233	2,039	14	162,244	24

Table 1.11
Live Births by Live Birth Order and Age of Mother, Michigan Residents, 1981

LIVE BIRTH ORDER	AGE OF MOTHER							
	UNDER 20 YEARS	20-24 YEARS	25-29 YEARS	30-39 YEARS	40 OR MORE YEARS	NOT STATED	ALL AGES	MEDIAN AGE AT LAST BIRTHDAY
First Birth	14,960	23,750	15,343	4,990	58	4	59,105	22
Second Birth	3,154	16,541	17,329	8,342	86	2	45,454	25
Third Birth	429	5,495	9,149	6,984	100	2	22,159	27
Fourth Birth	57	1,299	3,086	3,546	123	-	8,111	29
Fifth Birth or Greater	7	361	1,287	2,811	358	-	4,824	32
Not Stated	90	291	333	206	4	2	926	26
All Birth Orders	18,697	47,737	46,527	26,879	729	10	140,579	25

percent in 1981. Similarly, second order births to women 25 years or older increased from 38.0 percent of all second order births in 1971 to 56.7 percent in 1981. This change in mother's age at birth is reflective of the emergence of the 25-29 year age group as the group with the highest age-specific birth rate (Table 1.8).

INTERPREGNANCY TIME PERIOD

In 1971 50 percent of all live births to women with prior terminations were reported as being spaced at least 2 years and 6 months apart. By 1975 the median time span had increased to 2 years and 9 months. In 1976 and 1977 the median value was unchanged. By 1981 the median had declined to 2 years and 6 months. This trend is reflective of the changes in age-specific live birth rates of women between the ages of 30 and 39 (see Figure 1.4).

The distribution of birth spacings was very similar in 1971 and 1981. In each year, about one third of the births to women with prior deliveries occurred one to two years after the most recent pregnancy termination. Another quarter of the births had spacings of two to three years. In both 1971 and 1981 fewer than 4 percent of the births occurred less than a year after the termination of the most recent prior pregnancy (Table 1.12).

In 1981 women having live births whose most recent prior termination was a fetal death had a median time span of 1 year and 9 months between their previous termination and a live birth (Table 1.13). This compares to a median of 2 years 8 months for prior live births. Although 1 to 2 years was the modal time span for both groups, the percent of women with prior fetal deaths in this interval (47.4) was much larger than that for women with prior live births (29.3). The greatest relative difference was associated with time spans of less than one year. A spacing of less than one year was observed for 11.9 percent of all women reporting their most recent prior pregnancy as a fetal death. This compares to 1.6 percent of all women reporting their most recent prior pregnancy as a live birth.

PRENATAL CARE

The most common month of pregnancy in which women first obtain prenatal care is the second month. In 1981 nearly 40 percent of all women having live births initiated care during the second month. The median number of prenatal visits was twelve, and 59.6 percent of all live births were to women receiving 10-14 prenatal visits. Table 1.14 indicates the relationship between the month of pregnancy prenatal care began and the number of prenatal visits. For

Table 1.12
Live Births to Women Reporting Prior Pregnancy Terminations[1] by Time Span Between Last and Current Termination, Michigan Residents, 1971 and 1981

TIME SPAN IN YEARS	1971		1981	
	NUMBER	PERCENT	NUMBER	PERCENT
Total	102,158	100.0	84,514	100.0
Less Than One	3,810	3.7	3,052	3.6
1 < 2	33,347	32.6	27,694	32.8
2 < 3	24,854	24.3	21,012	24.9
3 < 5	23,655	23.2	18,665	22.1
5 or More . .	16,492	16.1	14,091	16.7
Median . . . Time Span . .	2 years 6 months	000	2 years 6 months	000

---

[1] Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

Table 1.13

Live Births to Women Reporting Prior Pregnancy Terminations[1] by Time Span Between Last and Current Termination and by Whether Prior Termination Resulted in a Live Birth or a Fetal Death[2], Michigan Residents, 1981

TIME SPAN IN YEARS	TOTAL		PRIOR FETAL DEATH		PRIOR LIVE BIRTH	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
TOTAL	84,514	100.0	16,286	100.0	68,228	100.0
Less Than One	3,052	3.6	1,936	11.9	1,116	1.6
1 < 2	27,694	32.8	7,721	47.4	19,973	29.3
2 < 3	21,012	24.9	2,804	17.2	18,208	26.7
3 < 5	18,665	22.1	2,250	13.8	16,415	24.1
5 or More . .	14,091	16.7	1,575	9.7	12,516	18.3
Median . . . Time Span . .	2 years 6 months	000	1 year 9 months	000	2 years 8 months	000

[1] Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

[2] Fetal death as defined for the pregnancy history on the birth record is a fetal death of any gestational age.

Table 1.14
Live Births by Month Prenatal Care Began and Number of Prenatal Visits, Michigan Residents, 1981

MONTH CARE BEGAN	NUMBER OF VISITS								
	TOTAL	NONE	1-4	5-9	10-14	15-19	20 OR OVER	UNKNOWN	MEDIAN NUMBER OF VISITS
Total	140,579	930	4,503	28,427	83,804	13,749	2,664	6,502	12
First	16,641	-	139	1,394	10,643	3,318	792	355	13
Second	55,575	-	384	6,787	39,455	7,028	1,177	744	12
Third	37,084	-	532	8,280	24,668	2,557	503	544	11
Fourth	12,950	-	551	5,248	6,200	584	117	250	10
Fifth	6,193	-	697	3,385	1,791	153	44	123	8
Sixth	3,217	-	662	1,838	603	49	10	55	7
Seventh	1,842	-	608	1,015	169	9	8	33	6
Eighth	993	-	598	320	47	7	2	19	4
Ninth	355	-	248	46	26	7	3	25	2
No Care	930	930	-	-	-	-	-	-	-
Unknown	4,799	-	84	114	202	37	8	4,354	10

births in which the mother began receiving care in the first month, the median number of visits was 13. The median number of visits is lower as prenatal care begins later.

The proportion of live births to women who initially obtained prenatal care in the first trimester of pregnancy was 77.7 percent in 1981. This percent has increased steadily since 1970 when the figure was 69.0 (Figure 1.6).

There were also small but steady increases in the percent of births to women receiving care prior to the sixth month of pregnancy over the period 1970-1975. In 1970, 86.0 percent of all live births were to women who received care prior to the sixth month of pregnancy. By 1975, this had risen to 91.6 percent. Since 1975 the figure has remained at that level. In 1981 the figure was 91.4 percent.

The proportion of births to women receiving early prenatal care varied considerably by race of infant and age of mother (Table 1.15). In 1981, 81.2 percent of white infants compared to 61.4 percent of other than white infants were born to mothers who began their prenatal care in the first trimester. Women 25-29 and 30-34 years of age sought care most promptly, with 84.4 percent and 84.7 percent, respectively, obtaining prenatal care in the first three months. The proportion of births to women receiving early prenatal care declined as maternal age increased or decreased, falling to 70.9 percent for women 40 years or over. Less than 6 in 10 (56.9 percent) mothers 15-19 years of age received care early, while only 35.3 percent of mothers under age 15 received care during the first trimester. Similar patterns by age of mother in this proportion are evident for white and other than white infants.

The time prenatal care began varied with live birth order (Table 1.16). The proportion of births to women who began care during the first trimester was highest for second order live births (80.8) and lowest for fifth or higher order births (62.8). Conversely, the proportion of births to women who began care during the third trimester, or received no care, was lowest (2.2 percent) for second order live births. This figure increased with the number of previous live births. Among fifth order live births 7.2 percent were to women who had received no care by the beginning of the 7th month of the pregnancy.

The proportion of births to mothers having ten or more prenatal visits was 71.3 percent in 1981, compared to 70.2 percent in 1980. This statistic varied considerably by race. While mothers of 75.2 percent of white infants had at least ten prenatal visits, the percent was only 52.7 for other than white infants (Table 1.17). For other than white infants this percent declined between 1980 and 1981 (54.1 to

FIGURE 1.6 PERCENT OF WOMEN HAVING LIVE BIRTHS WHO RECEIVED CARE PRIOR TO THE 4TH MONTH AND THE 6TH MONTH OF PREGNANCY, MICHIGAN RESIDENTS, 1970-1981

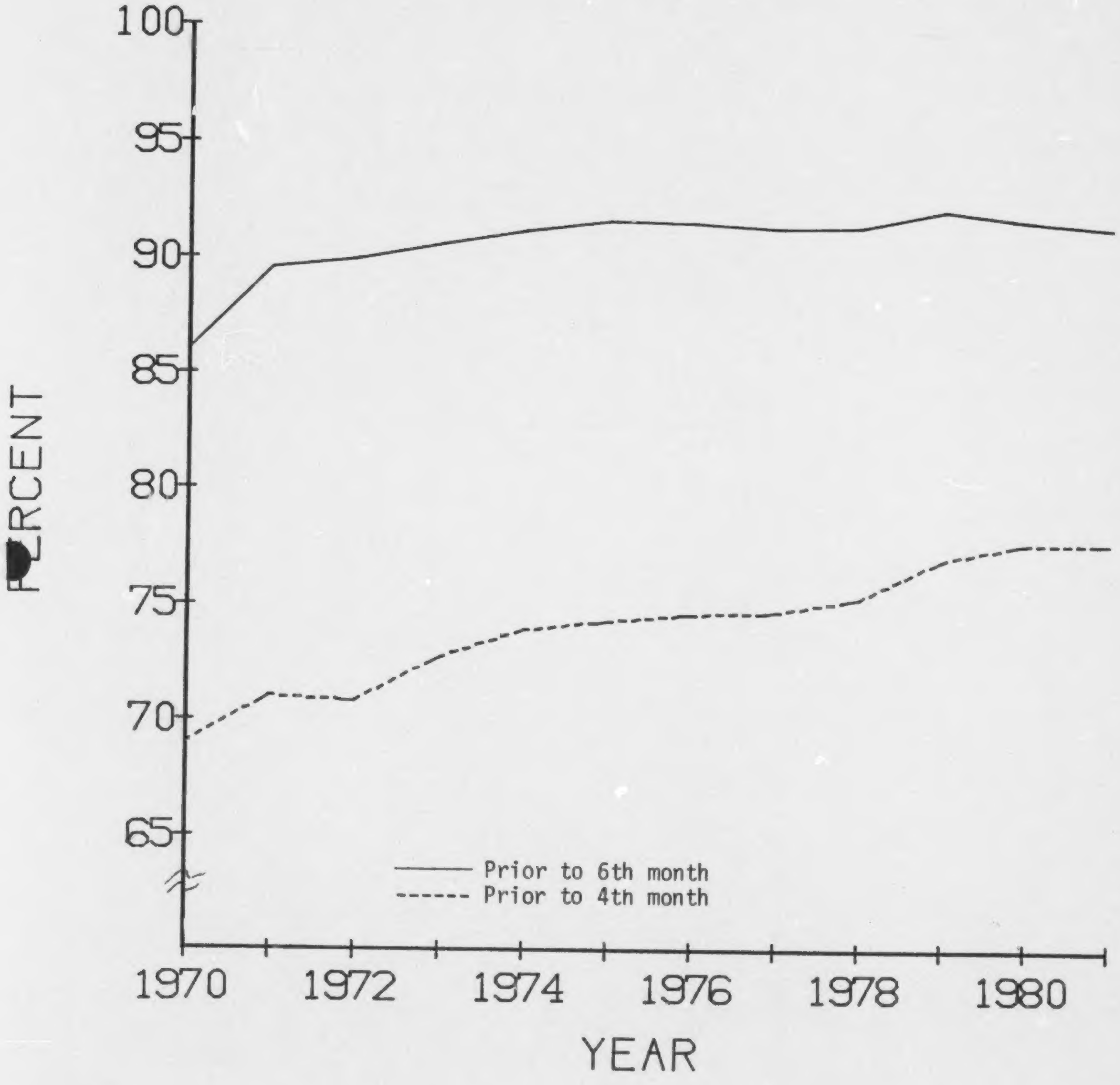


Table 1.15
Numbers and Percents of Live Births with Prenatal Care Beginning in the First Trimester by Age of Mother and Race of Child, Michigan Residents, 1981

AGE OF MOTHER	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]
Under 15 Years........	106	35.3	42	43.3	64	31.7	-	*
15-19 Years...........	10,461	56.9	7,744	59.8	2,709	50.0	8	44.4
20-24 Years...........	36,410	76.3	31,303	79.5	5,097	61.3	10	26.3
25-29 Years...........	39,264	84.4	35,013	87.1	4,246	67.6	5	18.5
30-34 Years...........	18,777	84.7	16,523	87.3	2,246	69.3	8	47.1
35-39 Years...........	3,760	80.0	3,167	82.9	591	67.2	2	*
40 Years or Over......	517	70.9	417	72.8	100	64.1	-	*
Not Stated............	5	50.0	5	55.6	-	*	-	*
Total.................	109,300	77.7	94,214	81.2	15,053	61.4	33	31.7

[1] Percent denominators obtained from Table 1.6.

Table 1.16
Live Births by Month of Pregnancy Prenatal Care Began and Live Birth Order, Michigan Residents, 1981

MONTH OF PREGNANCY CARE BEGAN	LIVE BIRTH ORDER						
	TOTAL	FIRST	SECOND	THIRD	FOURTH	FIFTH OR GREATER	NOT STATED
1st Month.......	16,641	7,116	5,744	2,526	786	411	58
2nd Month.......	55,575	23,644	18,884	8,549	2,878	1,358	262
3rd Month.......	37,084	15,054	12,107	6,214	2,249	1,261	199
4th Month.......	12,950	5,453	3,829	2,060	889	637	82
5th Month.......	6,193	2,734	1,662	948	458	345	46
6th Month.......	3,217	1,474	799	486	243	184	31
7th Month.......	1,842	856	461	269	126	119	11
8th Month.......	993	432	240	154	70	88	9
9th Month.......	355	145	104	45	28	25	8
No Care.........	930	342	202	153	92	114	27
Not Stated......	4,799	1,855	1,422	755	292	282	193
TOTAL...........	140,579	59,105	45,454	22,159	8,111	4,824	926
Percentage Beginning Care In First Trimester.......	77.7	77.5	80.8	78.0	72.9	62.8	56.0
Percentage Without Care During First Six Months......	2.9	3.0	2.2	2.8	3.9	7.2	5.9

Table 1.17
Live Births and Percent Distribution by Number of the Mother's Prenatal Visits and Race of Child, Michigan Residents, 1981

NUMBER OF PRENATAL VISITS	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
None....................	930	0.7	483	0.4	444	1.8	3	2.9
1-4.....................	4,503	3.2	2,766	2.4	1,735	7.1	2	1.9
5-9.....................	28,427	20.2	22,489	19.4	5,927	24.2	11	10.6
10-14...................	83,804	59.6	73,734	63.6	10,041	41.0	29	27.9
15-19...................	13,749	9.8	11,542	10.0	2,201	9.0	6	5.8
20 or Over..............	2,664	1.9	1,987	1.7	675	2.8	2	1.9
Not Stated..............	6.502	4.6	2,971	2.6	3.480	14.2	51	49.0
Total...................	140,579	100.0	115,972	100.0	24,503	100.0	104	100.0
Median Number of Visits..	12	000	12	000	10	000	11	000
Mean Number of Visits....	11.1	000	11.3	000	10.3	000	10.5	000

52.7), while for white infants it increased (73.8 to 75.2). The median number of prenatal visits was 12 for mothers of white children and 10 for mothers of other than white children (excluding those having an unknown number of visits). The mean number of prenatal visits was 11.3 for mothers of white infants, 9.7 percent higher than the mean of 10.3 visits for mothers of infants of other races.

In 1981, 930 resident live births or 6.6 of every 1,000 live births occurred with the mother having had no prenatal care. This figure includes only those where it was specified that the mother received no prenatal care. The comparative statistic was 6.5 in 1980 and 12.3 in 1971. Those who received no prenatal care were for the most part younger mothers (median age of 22). Also, the lack of prenatal care is disproportionately high among mothers of other than white infants. The ratio of live births in which the mother received no prenatal care to the total number of live births was four times as large for other than white infants as for white infants in 1981 (Table 1.18).

BIRTH WEIGHT

The mean weight for all live births was 3,356 grams or approximately 7 pounds 6 ounces. The median weight was 3,400 grams or about 7 pounds 8 ounces (Table 1.19).

A subgroup of major importance when analyzing birth weight trends is the category of infants weighing 2,500 grams or less (approximately 5 pounds 8 ounces or less) at birth. Such infants have historically experienced higher mortality in their first year of life than heavier infants. In 1981, approximately 69 of every 1,000 live births weighed 2,500 grams or less (Table 1.20).

The proportion of low birth weight infants varies with the race of the child, the age of the mother, and the amount of prenatal care the mother has received. Note that these three factors are interrelated. Very young mothers and mothers who are not white have fewer prenatal visits; women whose race is not white have higher birth rates in the younger age groups, etc. Tables 1.20 and 1.21 present data on these three variables with respect to birth weight.

The age group with the highest low birth weight ratio (103.3) was the group of mothers under 15 years of age. This ratio was lower for each succeeding age group through age group 25-29 (59.9) then increased for the older age groups to 91.9 for mothers 40 years or older (Table 1.20).

When low birth weight ratios are examined by the number of the mother's prenatal visits even more striking variations are evident. The low birth weight ratio for the

Table 1.18
Live Births with No Prenatal Care by Age of Mother and Race of Child, Michigan Residents, 1981

AGE OF MOTHER	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	RATIO[1]	NUMBER	RATIO[1]	NUMBER	RATIO[1]	NUMBER	RATIO[1]
Under 15 years........	10	33.3	3	*	7	34.7	-	*
15-19 Years...........	281	15.3	145	11.2	136	25.1	-	*
20-24 Years...........	307	6.4	159	4.0	146	17.5	2	*
25-29 Years...........	194	4.2	89	2.2	105	16.7	-	*
30-39 Years...........	130	4.8	81	3.6	48	11.6	1	*
40 Years or Over......	8	11.0	6	10.5	2	*	-	*
Total.................	930	6.6	483	4.2	444	18.1	3	*
Median Age at Last Birthday..............	22	000	22	000	22	000	*	000

[1] Ratio per 1,000 live births. Ratio denominator obtained from Table 1.6.

Table 1.19
Live Births by Birth Weight and Race, Michigan Residents, 1981

WEIGHT AT BIRTH	RACE			
	TOTAL	WHITE	ALL OTHER	NOT STATED
500 Grams or Less..........	290	146	144	-
501-1,000 Grams............	697	443	254	-
1,001-1,500 Grams..........	807	555	250	2
1,501-2,000 Grams..........	1,809	1,242	567	-
2,001-2,500 Grams..........	6,149	4,235	1,911	3
2,501-3,000 Grams..........	22,013	16,101	5,907	5
3,001-3,500 Grams..........	50,513	41,221	9,250	42
3,501-4,000 Grams..........	41,955	37,154	4,775	26
4,001-4,500 Grams..........	13,197	12,120	1,066	11
4,501 Grams or More........	2,886	2,684	201	1
Not Stated.................	263	71	178	14
Total......................	140,579	115,972	24,503	104
Mean Weight in Grams.......	3,356.2	3,408.5	3,106.8	3,437.5
Median Weight in Grams.....	3,400.0	3,430.0	3,160.0	3,402.0

Table 1.20
Low Weight[1] Live Births and Low Birth Weight Ratios by Age of Mother and Race of Child, Michigan Residents, 1981

AGE OF MOTHER	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]
Under 15 Years........	31	103.3	10	103.1	21	104.0	-	*
15-19 Years...........	1,795	97.6	1,036	79.9	759	140.0	-	*
20-24 Years...........	3,386	70.9	2,305	58.5	1,078	129.6	3	*
25-29 Years...........	2,789	59.9	2,030	50.5	757	120.5	2	*
30-39 Years...........	1,681	62.5	1,193	52.5	488	118.4	-	*
40 Years or Over......	67	91.9	45	78.5	22	141.0	-	*
Not Stated............	3	*	2	*	1	*	-	*
Total.................	9,752	69.4	6,621	57.1	3,126	127.6	5	48.1
Median Age at Last Birthday..............	24	000	*	000	23	000	*	000

[1] 2,500 grams or less.

[2] Ratio denominators obtained from Table 1.6.

highest risk group was seven times that of the group with the lowest ratio. The low birth weight ratio was highest when the mother had no prenatal care (281.7). The ratio declined as the number of prenatal visits increased through 10-14 visits, where the ratio was 39.9. The low birth weight ratio was 76.2 for mothers with 20 or more prenatal visits. It is likely that a very high number of prenatal visits is associated with problems in the pregnancy (Table 1.21). For low birth weight infants the median number of the mother's prenatal visits was 9, compared to 12 for all infants. The mean number of visits for mothers of low birth weight infants was 9.1, 18.0 percent less than the mean of 11.1 for mothers of all infants. As low birth weight infants are more likely to have been born prematurely, the shorter prenatal period results in a reduction of the potential length of time for prenatal care.

Other than white infants have a substantially lower mean and median birth weight than white infants (Table 1.19). The low birth weight ratio for other than white infants was 127.6 compared with 57.1 for white infants (Table 1.21). Other than white infants and white infants show similar patterns of rising and falling ratios varying with changes in the age of the mother and frequency of prenatal visits. The low birth weight ratio for other than white infants varied from a high of 360.4 where the mother had no care to a low of 77.6 where the mother had 10-14 visits. The ratio for white infants varied from a high of 211.2 where the mother had no visits to a low of 33.6 where the mother had 15-19 prenatal visits (Table 1.21). Overall, the low birth weight ratio for other than white infants was 2.2 times the ratio for white infants. This is associated with a differential in the proportion of mothers having had fewer than 10 prenatal visits. While 22.2 percent of mothers having white infants had less than 10 prenatal visits, the corresponding figure for mothers having other than white infants was 33.1 percent (Table 1.17).

Examination of Table 1.20 reveals that the ratios for other than white infants vary less than those for white infants. For white infants the ratio associated with mothers under 15 years of age (103.1) is over twice that of mothers in the 25-29 year age group (50.5). For other than white infants the differential between the age groups with the highest and lowest ratios is less than 40 percent. The ratios for white and other than white infants are similar for mothers under age 15.

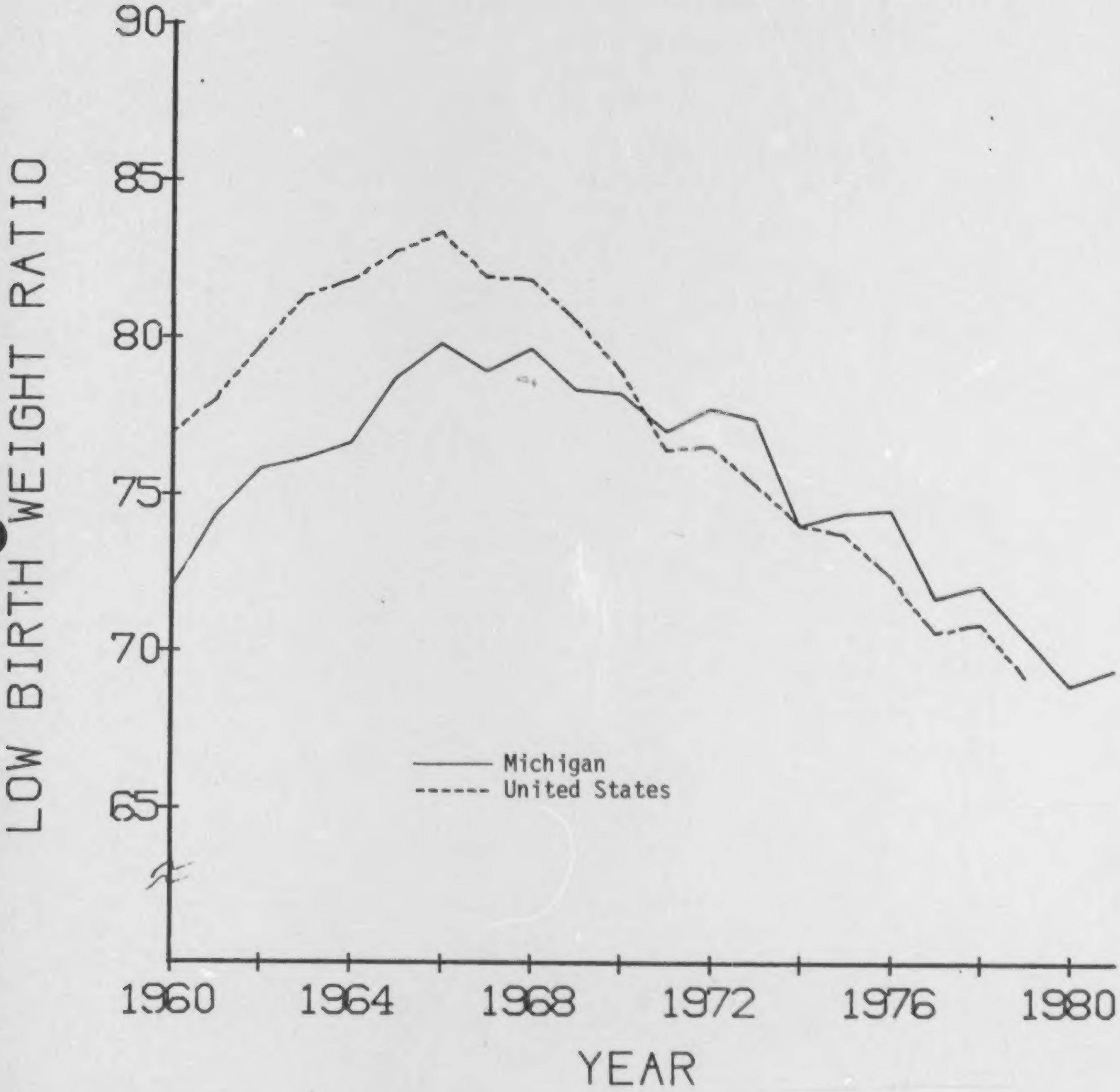
Figure 1.7 displays the low birth weight ratio for Michigan and the United States over the last twenty-two years. In 1960 this ratio was 72.0 for Michigan. Between 1960 and 1966 the ratio increased, reaching a high for the 22 year period in 1966 (79.8). Since that time the ratio has generally declined. The ratio for 1981 was 69.4,

Table 1.21
Low Weight[1] Live Births and Low Birth Weight Ratios by Number of Prenatal Visits and Race of Child, Michigan Residents, 1981

NUMBER OF PRENATAL VISITS	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]	NUMBER	RATIO[2]
None..........................	262	281.7	102	211.2	160	360.4	-	*
1-4...........................	1,043	231.6	577	208.6	466	268.6	-	*
5-9...........................	3,454	121.5	2,502	111.3	951	160.5	1	*
10-14.........................	3,343	39.9	2,564	34.8	779	77.6	-	*
15-19.........................	597	43.4	388	33.6	208	94.5	1	*
20 or Over....................	203	76.2	135	67.9	68	100.7	-	*
Not Stated....................	850	130.7	353	118.8	494	142.0	3	*
Total.........................	9,752	69.4	6,621	57.1	3,126	127.6	5	48.1
Median Number of Visits......	9	000	9	000	8	000	*	000
Mean Number of Visits........	9.1	000	9.3	000	8.3	000	*	000

[1] 2500 grams or less.
[2] Ratio denominators obtained from Table 1.17.

FIGURE 1.7 LOW BIRTH WEIGHT RATIO, MICHIGAN AND UNITED STATES RESIDENTS, 1960-1981[1]



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[1] 1980 and 1981 data for the U.S. are not available.

slightly higher than the rates of 68.9 for 1980. The pattern for the United States has been similar. The ratio increased from 76.9 in 1960 to 83.3 in 1966, and has since declined. In 1979 the low birth weight ratio for the nation was 69.2. The ratio for the United States was above that for Michigan each year from 1960 through 1970. Since then the ratio for the nation has been the same or lower than that of Michigan.

SEX OF INFANT

In 1981 51.2 percent of the infants born to Michigan residents were male. The proportion of males to females varies by race. The number of males per 1,000 females was 1,053 for white infants, 1,016 for blacks, 1,112 for American Indians, and 1,102 for infants of all other races (Table 1.22). For each race the low birth weight ratio for females is higher than for males. The ratio of 75.2 for females of all races is 17.9 percent above the corresponding ratio of 63.8 for males.

MOTHER'S EDUCATION

Educational attainment of women having live births in 1981 varied with their age (Table 1.23). Of all Michigan resident live births in 1981, 20.4 percent were to women who had not completed high school. The majority (63.1 percent) of mothers aged less than 20 had not completed high school. The percent of mothers with fewer than 4 years of high school dropped to 21.0 for those aged 20-24 and to 8.9 for mothers aged 25-34. This percent increased to 12.6 for mothers aged 35-39 and to 21.1 for mothers 40 years or older. Conversely, age of mother varied with the level of education. The median age of the mother was 20 years for those with 9 to 11 years of education and 29 years for women with 4 or more years of college.

Birth order varies with the mother's education as well as her age. Table 1.24 indicates that although the median age of mothers increases with educational level, the first birth ratio (number of first live births per 100 live births) also varies directly with educational attainment. The first birth ratio for mothers with 4 or more years of college was 45.6 compared to 36.2 for mothers with 8 or fewer years of education. Within each age group there are increases in the first birth ratio as educational level rises beyond the category of 9-11 years of education. For live births to women 20-24 years of age who had completed 4 or more years of college, 83.6 percent were to women with no previous live births, while only 25.8 percent of the live births to women of the same age who had not completed high school were first births. Mothers with 9 to 11 years of

Table 1.22
Live Births, Low Weight Live Births, and Low Birth Weight Ratios, by Sex and Race, Michigan Residents, 1981

Race	Live Births				Low Weight Live Births			Low Birth Weight Ratios		
	Total[1]	Male	Female	Males per 1,000 Females	Total[1]	Male	Female	Total[1]	Male	Female
Total	140,579	71,935	68,640	1,048	9,752	4,591	5,159	69.4	63.8	75.2
White	115,972	59,492	56,478	1,053	6,621	3,197	3,423	57.1	53.7	60.6
Black	22,705	11,444	11,259	1,016	3,024	1,346	1,677	133.2	117.6	148.9
American Indian	526	277	249	1,112	31	14	17	58.9	50.5	68.3
Other	1,272	667	605	1,102	71	31	40	55.8	46.5	66.1
Unknown	104	55	49	1,122	5	3	2	48.1	*	*

[1] Records with sex not stated are included only in total columns.

Table 1.23
Live Births by Age and Education of Mother, Michigan Residents, 1981

AGE OF MOTHER	MOTHER'S EDUCATION							PERCENT WITH AT LEAST HIGH SCHOOL EDUCATION
	TOTAL	8TH GRADE OR LESS	1-3 YEARS HIGH SCHOOL	4 YEARS HIGH SCHOOL	1-3 YEARS COLLEGE	4 OR MORE YEARS COLLEGE	NOT STATED	
Under 20 Years	18,697	1,158	10,648	6,159	597	3	132	36.2
20-24 Years	47,737	855	9,170	27,244	8,760	1,458	250	78.5
25-29 Years	46,527	539	3,823	21,054	12,389	8,492	230	90.1
30-34 Years	22,178	374	1,355	7,736	5,492	7,109	112	91.7
35-39 Years	4,701	148	445	1,694	977	1,408	29	86.8
40 or More Years	729	52	102	284	147	137	7	77.9
Not Stated	10	-	1	3	1	1	4	50.0
Total	140,579	3,126	25,544	64,174	28,363	18,608	764	79.1
Median Age at Last Birthday	25	22	20	24	26	29	24	000

Table 1.24
First Birth Ratios[1] by Age and Education of Mother, Michigan Residents, 1981

AGE OF MOTHER	MOTHER'S EDUCATION					
	TOTAL	8TH GRADE OR LESS	1-3 YEARS HIGH SCHOOL	4 YEARS HIGH SCHOOL	1-3 YEARS COLLEGE	4 OR MORE YEARS COLLEGE
Under 20 Years	80.0	74.0	77.2	85.2	93.3	*
20-24 Years	49.8	21.8	26.2	51.7	65.7	83.6
25-29 Years	33.0	9.8	9.7	26.3	36.2	57.0
30-34 Years	19.9	7.2	6.0	14.2	19.5	29.8
35 or More Years	11.8	4.0	3.8	8.6	11.5	20.1
Total	42.0	36.2	43.4	40.8	42.3	45.6

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[1] First live births per 100 live births. Births where the mother's age and/or education are not stated are included in the total but are not reallocated to specific age and education categories.

education had the lowest or second lowest first birth ratio within each age interval taken separately but the second highest total first birth ratio (43.4). This high overall ratio reflects the fact that a relatively large proportion of births to mothers with 9 to 11 years of education occurred before the age of 20.

CONGENITAL ANOMALIES

One or more congenital anomalies were reported for 1,135 of the 140,579 resident live births in 1981 (Table 1.25). This translates to a rate of 80.7 per 10,000 live births.

In 1979 the 9th Revision of the International Classification of Diseases was introduced for the coding of reported congenital anomalies. Care should be exercised in making comparisons between the reported incidences of specific types of anomalies for years during which different revisions of the ICD were used to classify anomalies. In addition the frequency of reporting of specific anomalies is affected by the reporting schedule. Many conditions may not be apparent at the time the birth certificate is completed and filed.

The most frequently reported categories were ICD 754, certain congenital musculoskeletal deformities (including clubfoot), and ICD 755, other congenital anomalies of limbs (excluding those classified to 754), with 144 and 268 anomalies, respectively. When these categories are combined with the category 756, other congenital musculoskeletal anomalies, the total number of musculoskeletal system anomalies reported increases to 474, or 36.0 percent of all anomalies reported. There were 154 anomalies coded to ICD 752, congenital anomalies of genital organs.

Congenital anomaly rates by age of mother and race of child are presented in Table 1.26. The rates for all races combined display a parabolic relationship with age of mother. The highest rates were experienced by mothers 40 years or over and those under 20 years of age. The lowest risk category was the age group 30-34 years. Congenital anomaly rates for white infants show a similar pattern of variation by age of mother. Rates for infants of other races were more stable, and the lowest risk category was the 35-39 year age group. For mothers under 35 years the rates for other than white infants were somewhat higher than for white infants. The overall rate for white infants was 74.2 compared to 111.4 for infants of other races.

Figure 1.8 displays the rate of reported congenital anomalies for Michigan resident live births over the period 1960-1981. The rate has exhibited a cyclical pattern over

Table 1.25
Congenital Anomalies[1] Reported by Type of Anomaly, Michigan Residents, 1981

TYPE OF ANOMALY	ICD[3] NUMBER	NUMBER OF CONDITIONS[4]	RATE PER 10,000 LIVE BIRTHS
Other congenital anomalies of limbs	755	268	19.1
Congenital anomalies of genital organs	752	154	11.0
Certain congenital musculoskeletal deformities	754	144	10.2
Other congenital anomalies of heart	746	116	8.3
Cleft palate and cleft lip	749	111	7.9
Congenital anomalies of the integument	757	65	4.6
Chromosomal anomalies	758	63	4.5
Other congenital musculoskeletal anomalies	756	62	4.4
Other and unspecified congenital anomalies	759	55	3.9
Spina bifida	741	45	3.2
Other congenital anomalies of nervous system	742	35	2.5
Other congenital anomalies of circulatory system	747	31	2.2
Other congenital anomalies of digestive system	751	29	2.1
Congenital anomalies of ear, face and neck	744	28	2.0
Other congenital anomalies of upper alimentary tract	750	26	1.8
Anencephalus and similar anomalies	740	24	1.7
Congenital anomalies of urinary system	753	20	1.4
Congenital anomalies of eye	743	18	1.3
Congenital anomalies of respiratory system	748	16	1.1
Bulbus cordis anomalies and anomalies of cardiac septal closure	745	7	0.5
At Least One Anomaly[2]		1,135	80.7

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[1] Indicates anomalies apparent soon after a live birth.

[2] Does not equal the sum of anomalies specified because of multiple anomaly occurrences.

[3] Ninth Revision International Classification of Diseases, WHO.

[4] Includes three digit duplicates if fourth digit is different, permitting total counting of distinct conditions.

Table 1.26
Live Births With Congenital Anomalies Reported and Congenital Anomaly Rates[1] by Age of Mother and Race of Child, Michigan Residents, 1981

AGE OF MOTHER	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]
Under 15 Years............	5	166.7	1	*	4	*	-	*
15-19 Years...............	180	97.8	114	88.0	66	121.8	-	*
20-24 Years...............	406	85.0	315	80.0	90	108.2	1	*
25-29 Years...............	358	76.9	290	72.1	68	108.2	-	*
30-34 Years...............	138	62.2	101	53.4	37	114.2	-	*
35-39 Years...............	39	83.0	32	83.8	7	79.5	-	*
40 Years or Over..........	9	123.5	8	139.6	1	*	-	*
Total.....................	1,135	80.7	861	74.2	273	111.4	1	*
Median Age at Last Birthday..................	24	000	25	000	23	000	*	000

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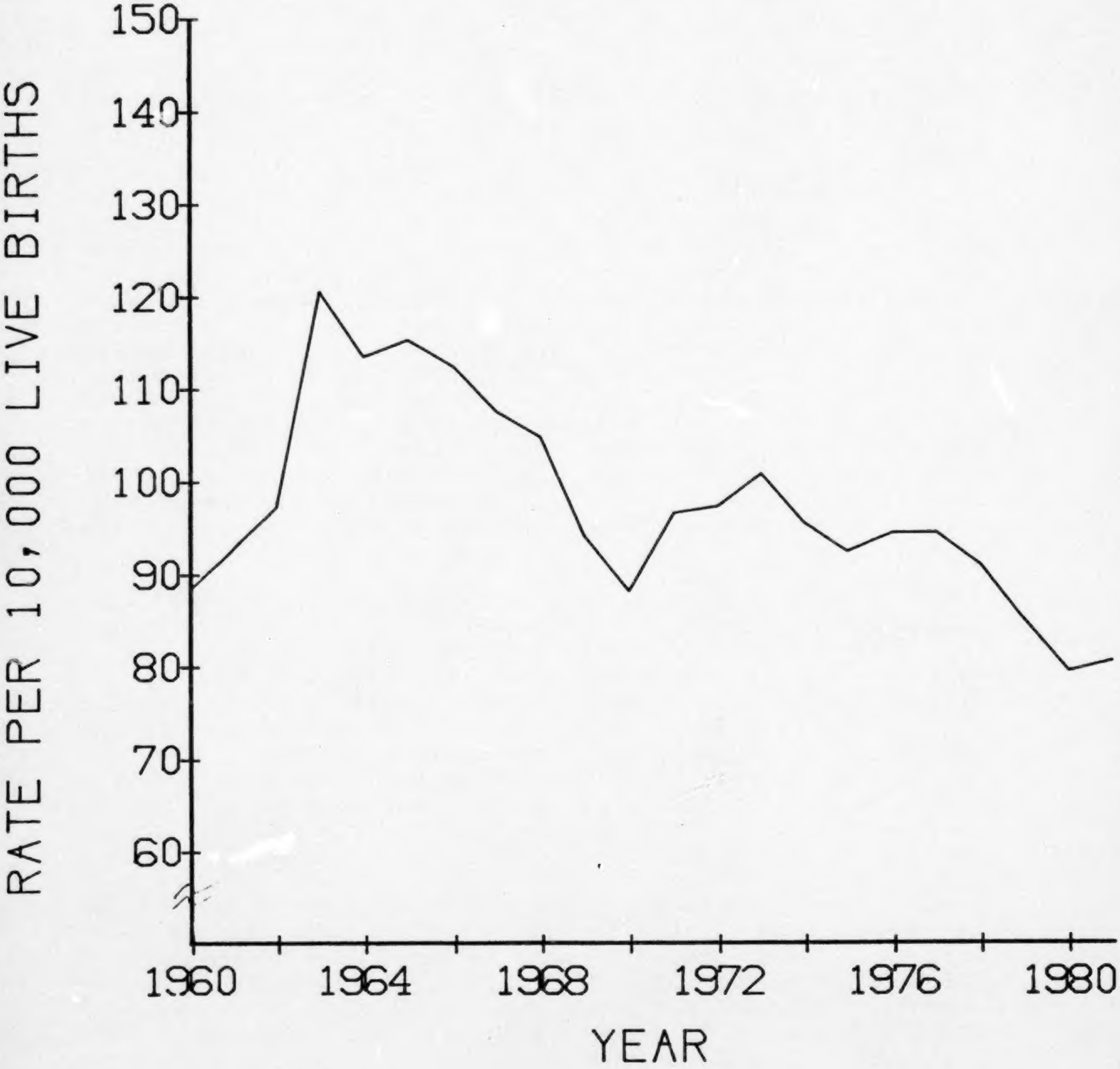
[1] Number of live births with congenital anomalies reported per 10,000 live births.
[2] Rate denominator obtained from Table 1.6.

Figure 1.8 Incidence of Congenital Anomalies Reported Per 10,000 Live Births Michigan Residents 1960-1981



this time period. The rate rose from 88.4 per ten thousand live births in 1960 to 120.6 in 1963. By 1970 the rate had returned to the level of 1960 (88.3). The rate then rose to 100.8 in 1973. Since 1973 the rate has declined by 19.9 percent. The rate of 80.7 for 1981 is slightly higher than the rate of 79.6 in 1980.

COMPLICATIONS

The numbers of deliveries with specific types of complications reported are shown in Table 1.27. These data represent entries in three boxes on the live birth certificate: complications of pregnancy, concurrent illnesses or conditions affecting this pregnancy, and complications of labor and/or delivery. It is important to note that these items are under-reported on the birth certificate. Some conditions or procedures, such as obstetrical operations, may be routinely performed by some physicians, and hence not be considered "complications". In addition to valid complications there are also inappropriate terms entered, such as "prematurity", "spontaneous delivery", or "home delivery". These inappropriate terms were omitted in the tabulations of complications shown in Tables 1.27 and 1.28. The total number of deliveries with entries in one or more of the three "complication" boxes was 39,524. Of these, 37,096 (93.9 percent) had one or more valid complications. This is a rate of 26.4 per 100 live births.

It should be noted that in some cases the code used to describe the complication is dependent on the box in which the entry is found, while in other cases the same code is given regardless of the box used. An example of the latter situation is chronic hypertension, which is shown in Table 1.27 under the heading "Concurrent illnesses or conditions affecting this pregnancy" regardless of the box in which it was entered on the birth certificate. Thus, there were 7,501 deliveries (533.6 per 10,000 live births) with one or more entries which were coded to the various categories under the heading "Concurrent illnesses or conditions affecting this pregnancy", while the number of births with one or more entries in the box bearing this title on the birth certificate was only 5,515 (392.3 per 10,000 live births). This latter figure is comparable to the rate of 308.2 reported for 1978, as prior to 1979 specific types of complications were not coded and tabulated. Rates presented for "Concurrent illnesses or conditions affecting this pregnancy", "Complications of pregnancy", and "Complications of labor and/or delivery" were derived from the numbers of records with entries in these boxes.

Among the most commonly reported maternal conditions not directly related to the pregnancy were chronic

Table 1.27
Live Births with Specific Types of Complications Reported, Michigan Residents, 1981

TYPE OF COMPLICATION	NUMBER OF DELIVERIES[1]	RATE PER 10,000 LIVE BIRTHS
Concurrent illnesses or conditions affecting this pregnancy	7,501	533.6
Chronic circulatory and genitourinary diseases in mother	1,869	133.0
Chronic rheumatic heart disease	58	4.1
Chronic hypertensive disease	1,177	83.7
Other chronic diseases and congenital anomalies of heart and circulatory system	194	13.8
Chronic diseases of genitourinary system	466	33.1
Other maternal conditions	5,891	419.1
Syphilis	9	0.6
Gonorrhea and other VD, excluding syphilis	63	4.5
Diabetes mellitus	771	54.8
Influenza	20	1.4
Rubella	9	0.6
Injury	44	3.1
Prior operations (excluding previous cesarean section)	156	11.1
Previous cesarean section	2,412	171.6
Narcotic or drug user	304	21.6
Obesity	260	18.5
Hepatitis	18	1.3
Anemia	171	12.2
All other maternal conditions	1,519	108.1
Unknown type of maternal condition	312	22.2
Toxemia of pregnancy	2,220	157.9
Hypertensive disease arising during pregnancy	42	3.0
Pre-eclampsia of pregnancy	1,507	107.2
Eclampsia of pregnancy	45	3.2
Hypermesis gravidarum	103	7.3
Toxemia superimposed on pre-existing hypertensive cardiovascular disease	81	5.8
Other and unspecified toxemia of pregnancy	596	42.4
Maternal ante-and intrapartum infection	924	65.7
Infections of genital tract	159	11.3
Pyelitis and pyelonephritis	56	4.0
Other infections of urinary tract	305	21.7

Table 1.27 (continued)

TYPE OF COMPLICATION	NUMBER OF DELIVERIES[1]	RATE PER 10,000 LIVE BIRTHS
Infections of amniotic fluid	136	9.7
Other infections	302	21.5
Difficult labor with disproportion or abnormality of organs and tissues of the pelvis	4,066	289.2
Difficult labor with malposition of fetus	4,257	302.8
Breech presentation	2,970	211.3
Transverse presentation	215	15.3
Brow presentation	51	3.6
Face presentation	87	6.2
Compound or shoulder presentation	60	4.3
Other specified presentation	429	30.5
Unspecified presentation	497	35.4
Difficult labor with abnormality of forces of labor	1,006	71.6
Primary uterine inertia	289	20.6
Secondary uterine inertia	167	11.9
Prolonged second stage	143	10.2
Precipitate birth	324	23.0
Other and unspecified abnormality of forces of labor	90	6.4
Other and unspecified difficult labor	739	52.6
Laceration of pelvic organs	629	44.7
Conditions of placenta and fetal membranes	1,677	119.3
Placenta previa - partial	476	33.9
Placenta previa - complete	23	1.6
Premature separation of placenta - partial	800	56.9
Premature separation of placenta - complete	7	0.5
Placental insufficiency	45	3.2
Delivery complicated by retained placenta	301	21.4
Other and unspecified abnormalities of placenta and fetal membranes	70	5.0
Conditions of umbilical cord	3,069	218.3
Other complications of pregnancy and child birth	10,544	750.0
Incompetent cervix	299	21.3
Premature rupture of membranes	3,320	236.2

Table 1.27 (continued)

TYPE OF COMPLICATION	NUMBER OF DELIVERIES[1]	RATE PER 10,000 LIVE BIRTHS
Hydramnios	140	10.0
Ectopic pregnancy	4	0.3
Abortion - any type	15	1.1
Destructive operation on live fetus to facilitate birth	16	1.1
Multiple pregnancy	1,150	81.8
Hemorrhage or threatened abortion	723	51.4
RH incompatibility	542	38.6
Anemia of pregnancy	200	14.2
All other complications of pregnancy and childbirth	4,674	332.5
Unknown type of complication of pregnancy and childbirth	313	22.3
Obstetrical operations	17,892	1,272.7
Antepartum obstetrical procedures	56	4.0
Operations inducing labor or assisting delivery	2,372	168.7
Cesarean section	15,290	1,087.6
Operations after delivery or abortion	1,690	120.2
At least one complication	37,096	2,638.8

[1] Sum of subcategories may not equal total for category due to the occurrences of multiple complications.

hypertensive disease, diabetes mellitus, and previous Cesarean sections, which were reported 1,177, 771, and 2,412 times, respectively, in 1981. Toxemia of pregnancy was reported for 2,220 deliveries (157.9 per 10,000). The most common form was pre-eclampsia of pregnancy, which was reported 107.2 times per 10,000 deliveries. Various forms of difficult labor were reported in approximately 7 percent of all deliveries. There were 1,677 deliveries complicated by conditions of the placenta and fetal membranes, and 3,069 by conditions of the umbilical cord. Premature rupture of membranes was reported for 3,320 deliveries. There were 15,290 deliveries reported as Cesarean sections. It should be noted that the type of delivery is not a question on the birth certificate, so that the rate of 1,087.6 Cesarean sections per 10,000 deliveries undoubtedly understates the true rate.

The distribution by age of mother and race of infant for deliveries with complications reported is shown in Table 1.28. The rates were similar for mothers under age 30. Older mothers were more likely to experience complications. The rate increased from 26.0 percent for mothers 25-29 years to 35.4 percent for mothers 40 years or over. The median age of mothers for births with complications reported was 25 years, the same as for all live births. Similar patterns of variation by age of mother were observed for white and other than white infants. The rate for other than white infants was higher than for white infants in all age groups except under 15 years. Overall the rate for other than white infants was about 20 percent higher (30.5 compared to 25.5).

PLACE OF OCCURRENCE

Of some confusion to persons not familiar with vital records data is the difference between occurrence and residence figures. Information on events to residents of Michigan that occur throughout the country and, in some instances, outside its boundaries is collected in order to obtain the full scope of activity for the state population. In 1981 1,698 Michigan resident live births occurred outside the state. Information on these events is forwarded to the state of Michigan for statistical purposes only. While only 1.2 percent of the total for the state is involved, statistics for the counties on Michigan's southern and northwestern borders would be strongly affected were this information not available.

Table 1.29 shows the four major geographic areas where Michigan resident live births occur outside the state. These four border areas comprise 92.0 percent of all resident live births that occurred out of state. Live births to Michigan residents occurred in 37 of the 50 states in 1981 and in the District of Columbia.

Table 1.28
Live Births with Complications Reported and Complication Rates[1] by Age of Mother and Race of Child, Michigan Residents, 1981

AGE OF MOTHER	RACE OF CHILD							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	RATE[2]	NUMBER	RATE[1]	NUMBER	RATE[2]	NUMBER	RATE[2]
Under 15 Years........	76	25.3	25	25.8	51	25.2	-	*
15-19 Years...........	4,749	25.8	3,151	24.3	1,593	29.4	5	27.8
20-24 Years...........	12,308	25.8	9,857	25.0	2,447	29.4	4	*
25-29 Years...........	12,095	26.0	10,173	25.3	1,920	30.6	2	*
30-34 Years...........	6,140	27.7	5,049	26.7	1,088	33.6	3	*
35-39 Years...........	1,467	31.2	1,151	30.1	316	35.9	-	*
40 Years or Over......	258	35.4	196	34.2	62	39.7	-	*
Unknown...............	3	*	3	*	-	*	-	*
Total.................	37,096	26.4	29,605	25.5	7,477	30.5	14	13.5
Median Age at Last Birthday..............	25	000	25	000	24	000	*	000

[1] Number of live births with complications reported per 100 live births.

[2] Rate denominators obtained from Table 1.6.

Table 1.29
Michigan Resident Live Births Occurring Outside of Michigan by Place of Occurrence, and Live Births Occurring in Michigan to Non-Michigan Residents by Place of Residence, 1981

GEOGRAPHIC AREA	LIVE BIRTHS TO RESIDENTS OCCURRING OUTSIDE MICHIGAN		LIVE BIRTHS TO NONRESIDENTS OCCURRING IN MICHIGAN	
	NUMBER	PERCENT	NUMBER	PERCENT
Total.............	1,698	100.0	534	100.0
Indiana...........	522	30.7	142	26.6
Ohio..............	581	34.2	63	11.8
Wisconsin.........	420	24.7	176	33.0
Canada............	40	2.4	13	2.4
Other Areas.......	135	8.0	140	26.2

The number of nonresident live births that occurred in Michigan in 1981 was 534. Information about those events was shared with the appropriate states by the State of Michigan under specific confidentiality guidelines so they might have a complete statistical file on their residents. The border areas comprised 73.8 percent of these events, as shown in Table 1.29. There were live births in Michigan to residents of 29 states and at least 5 foreign countries.

PLACE OF BIRTH

In 1981 99.42 percent of the 139,415 infants born in Michigan were delivered in hospitals. There were 646 infants born at home, and 165 other non-hospital deliveries (Table 1.30). While the percentage of infants not born in hospitals is still very small, the number of home deliveries and other out-of-hospital births has increased in recent years. Between 1973 and 1981 the number of infants born at home increased by 129 percent. The proportion of all live-born infants who were delivered at home increased from 0.20 percent in 1973 to 0.46 percent in 1981 (130 percent increase).

ATTENDANT AT BIRTH

Data in Table 1.31 reveal that 99.4 percent of the live births which occurred in Michigan were attended by a physician, either an M.D. or D.O. There were 286 live births attended by the mother's husband, while nurses delivered 132 infants and midwives and nurse-midwives delivered 180 babies. During 1981 there were 87 infants born to unattended women.

Of the 646 infants born in the mother's home 17.8 percent were attended by a physician, while an additional 40.1 percent were attended by the husband.

Table 1.30
Live Births by Place of Delivery, Michigan Occurrences, 1973-1981

YEAR	TOTAL	PLACE OF DELIVERY					
		HOSPITAL		HOME		OTHER AND UNKNOWN	
		NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
1973	140,359	139,983	99.73	282	0.20	94	0.07
1974	136,418	136,049	99.73	282	0.21	87	0.06
1975	132,777	132,354	99.68	313	0.24	110	0.08
1976	130,253	129,714	99.59	375	0.29	164	0.13
1977	137,140	136,503	99.54	489	0.36	148	0.11
1978	137,896	137,119	99.44	573	0.42	204	0.15
1979	143,240	142,437	99.44	619	0.43	184	0.13
1980	144,077	143,257	99.43	645	0.45	175	0.12
1981	139,415	138,604	99.42	646	0.46	165	0.12

Table 1.31
Live Births by Place of Delivery and Type of Attendant, Michigan Occurrences, 1981

ATTENDANT	PLACE OF DELIVERY							
	TOTAL		HOSPITAL		HOME		OTHER AND UNKNOWN	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total	139,415	100.0	138,604	100.0	646	100.0	165	100.0
Physician, M.D.	118,459	85.0	118,323	85.4	91	14.1	45	27.3
Physician, D.O.	20,092	14.4	20,048	14.5	24	3.7	20	12.1
Husband	286	0.2	5	0.0	259	40.1	22	13.3
Nurse	132	0.1	123	0.1	7	1.1	2	1.2
Midwife	89	0.1	6	0.0	75	11.6	8	4.8
Physician's Asst.	8	0.0	8	0.0	-	-	-	-
Nurse-Midwife[1]	91	0.1	75	0.1	8	1.2	8	4.8
Other	163	0.1	12	0.0	101	15.6	50	30.3
Unattended	87	0.1	2	0.0	77	11.9	8	4.8
Unknown	8	0.0	2	0.0	4	0.6	2	1.2

[1] May or may not be certified by the American College of Nurse Midwives.

FETAL DEATHS

There were 1,325 fetal deaths reported in 1900. The number of reported fetal deaths increased from 1900 through 1916 and by 1916 there were 3,689 reported fetal deaths (Figure 1.9). The numbers of such deaths were relatively stable from 1916 through 1930, with the peak year for the period being 1927. This year marked the highest frequency of occurrence in this century with 3,834 fetal deaths. Over the period 1930 through 1939, fetal deaths declined to 2,572. Fetal deaths then increased through 1943, decreased in 1944 and 1945, and increased again to 3,422 in 1947. Fetal deaths numbered between 3,000 and 3,250 in the period 1948 to 1958. In the 1960's and 70's the number of reported fetal deaths declined sharply. By 1976, the number fell to 1,264, the lowest number reported in this century. After a slight increase in 1977 (1,284) new lows were recorded in each of the following four years. The number of Michigan resident fetal deaths was 1,083 in 1981.

Part of the decline in fetal deaths from 1977 to 1978 was due to the introduction of a new reporting form on October 1, 1978. The principal responsibility for reporting a fetal death was shifted from the funeral director to the hospital or other institution where the delivery occurred. Michigan resident fetal deaths numbered 963 in the first nine months of 1977 and 960 in the same period during 1978. There was a significant decline between 1977 and 1978 in the number of fetal deaths reported for the transitional month of October (116 in 1977 and 69 in 1978). In the last two months of 1977 there were 205 fetal deaths reported compared to 189 in the last two months of 1978. This problem of underreporting was addressed, and the fetal death files for 1979, 1980, and 1981 are believed to be complete.

The fetal death ratio for Michigan has declined through most of the twentieth century (Figure 1.10 and Table 4.2). The ratio rose from 30.3 in 1900 to 43.5 in 1905. Through the teens and early twenties, this ratio fluctuated between 38 and 42, never reaching the peak ratio observed in 1905. In 1922, Michigan's fetal death ratio was 42.0. The year 1922 marks a turning point, as fetal death ratios have generally declined since this year. The low ratio of 1900 was first succeeded by a new low ratio in 1936 (29.7). Over the next 45 years, new lows have been established repeatedly, as the fetal death ratio continues to decline. The ratio in 1981 was 7.7, the lowest observed in this century.

National fetal death data are presented in Figure 1.10 and Table 1.32. Michigan's fetal death ratios have generally been below national ratios. In fact, the United States ratio has been below that for Michigan in only nine of the 57 years for which national data are available. The

Figure 1.9 Fetal Deaths, Michigan Residents, 1900-1981

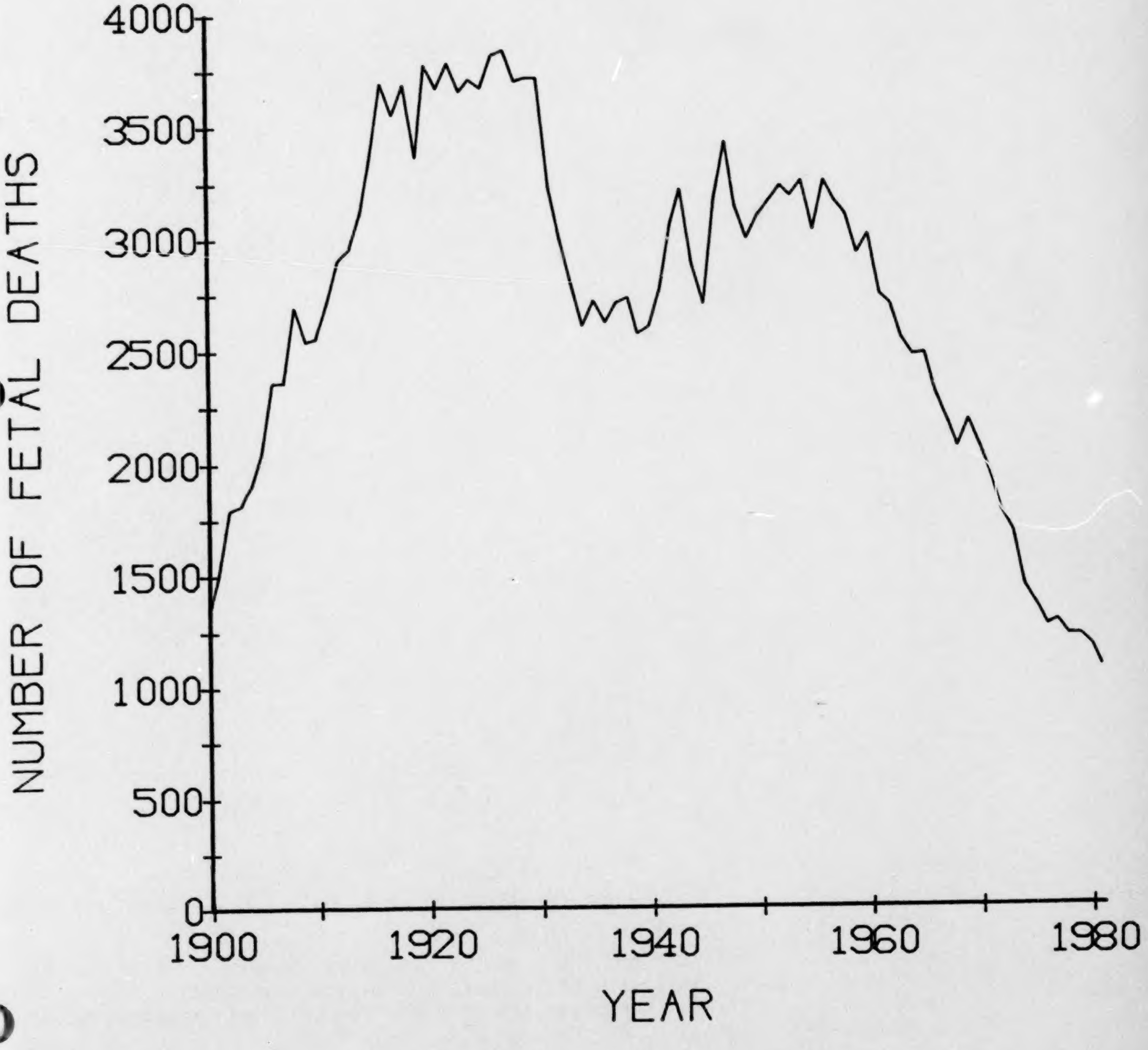
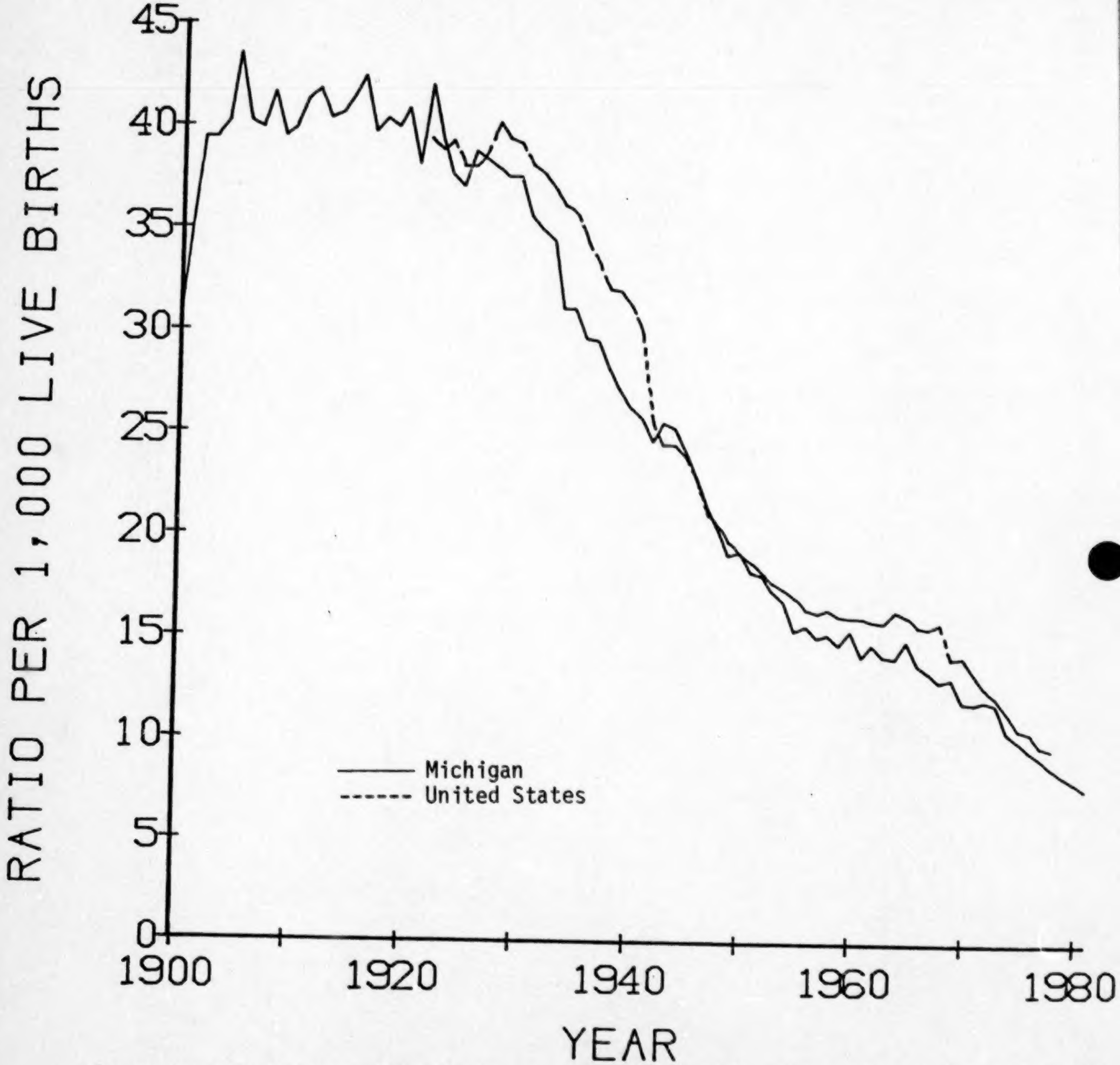


FIGURE 1.10 FETAL DEATH RATIOS, MICHIGAN RESIDENTS, 1900-1981, AND UNITED STATES RESIDENTS, 1922-1978[1]



[1] U.S. ratios prior to 1933 are for registration areas only. U.S. ratios are based on three different definitions of fetal death:

1) prior to 1942 - all reported fetal deaths regardless of period of gestation
2) 1942-1968 - fetal deaths with gestational age 20 weeks or more or not stated
3) 1969-current - fetal deaths of stated or presumed period of gestation of 20 or more weeks

Table 1.32
Fetal Deaths and Fetal Death Ratios, Michigan and United States Residents, 1900-1981

UNITED STATES		YEAR	MICHIGAN	
FETAL DEATHS	FETAL DEATH RATIOS		FETAL DEATHS	FETAL DEATH RATIOS
---	---	1900	1,325	30.3
---	---	1910	2,559	39.9
70,010[1]	39.4	1920	3,770	40.9
86,466	39.2	1930	3,714	37.6
73,802	31.3	1940	2,602	26.3
68,261	19.2	1950	3,095	19.3
68,480	16.1	1960	3,008	15.4
52,961	14.2	1970	2,060	12.0
47,818	13.4	1971	1,923	11.9
41,380	12.7	1972	1,770	12.1
38,309	12.2	1973	1,682	11.9
36,281	11.5	1974	1,438[2]	10.5[2]
33,796	10.7	1975	1,356[2]	10.1[2]
33,111	10.5	1976	1,264[2]	9.6[2]
33,053	9.9	1977	1,284[2]	9.3
32,301	9.7	1978	1,218[2]	8.8
---	---	1979	1,216	8.4
---	---	1980	1,176	8.1
---	---	1981	1,083	7.7

[1] Data for 1922.

[2] Revised.

last time the United States ratio was below the Michigan ratio was in 1950. In 1978, the Michigan ratio was 9.3 percent below the national ratio of 9.7. It should be noted that fetal deaths in Michigan are comprised of stillbirths that have passed through 20 weeks gestation. This definition is different from that of some states. (Since October 1 of 1978 stillbirths of fetuses of at least 20 completed weeks of gestation or weighing 400 grams or more are required to be reported as fetal deaths in Michigan. The impact of this change in definition on the number of fetal deaths reported has been minimal.

CAUSES OF FETAL DEATH

A classification of fetal deaths by underlying cause of death is contained in Table 1.33. This classification is based on the 9th Revision of the International Classification of Diseases which was introduced in 1979. Since major changes were made between the 8th and 9th revisions of the ICD in the section used for classifying causes of fetal death, comparisons between cause-specific ratios for 1979 and later years and those for years prior to 1979 require detailed study. Also, since a relatively large number of deaths are allocated to unspecified causes, caution should be exercised in attempting to draw specific inferences regarding causes of death.

In 1981, 275 of the total 1,083 deaths were assigned to the category of "Other and ill-defined conditions originating in the perinatal period" and of these 275 fetal deaths 226 were in the "unspecified" category. Half (49.1 percent) of the fetal deaths for which a cause was stated were attributed to complications of placenta, cord, and membranes (ICD 762). This is a group of maternal conditions which includes placenta previa, premature separation of the placenta, placental hemorrhage, and compression of the umbilical cord. Second in frequency was the category maternal complications of pregnancy (ICD 761), which was listed as the cause of 136 fetal deaths. This includes such complications as premature rupture of membranes, multiple pregnancy, and incompetent cervix. There were an additional 62 deaths caused by maternal conditions which may be unrelated to the pregnancy, of which 34 were attributed to maternal hypertensive disorders. Of the 75 fetal deaths caused by congenital anomalies, 15 were attributed to anencephalus or similar anomalies.

AGE OF MOTHER AND RACE OF FETUS

It appears that the younger, the older, and other than white mothers have a greater risk of delivering a stillborn fetus. The rates of fetal loss for mothers under 15 years

Table 1.33
Fetal Deaths and Fetal Death Ratios by Underlying Cause of Death, Michigan Residents, 1981

ICD No.[1]	CAUSE OF DEATH	FREQUENCY	RATIO[2]
740	Anencephalus and similar anomalies	15	10.7
741	Spina bifida	3	2.1
742	Other congenital anomalies of nervous system	12	8.5
745	Bulbus cordis anomalies and anomalies of cardiac septal closure	3	2.1
746	Other congenital anomalies of heart	2	1.4
747	Other congenital anomalies of circulatory system	1	0.7
749	Cleft palate and cleft lip	1	0.7
751	Other congenital anomalies of digestive system	1	0.7
756	Other congenital musculoskeletal anomalies	3	2.1
758	Chromosomal anomalies	7	5.0
759	Other and unspecified congenital anomalies	27	19.2
740-759	All congenital anomalies combined	75	53.4
760	Fetus or newborn affected by maternal conditions which may be unrelated to present pregnancy	62	44.1
761	Fetus or newborn affected by maternal complications of pregnancy	136	96.7
762	Fetus or newborn affected by complications of placenta, cord, and membranes	397	282.4
763	Fetus or newborn affected by other complications of labor and delivery	9	6.4
764	Slow fetal growth and fetal malnutrition	5	3.6
765	Disorders relating to short gestation and unspecified low birthweight	50	35.6
766	Disorders relating to long gestation and high birthweight	2	1.4
767	Birth trauma	1	0.7
768	Intrauterine hypoxia and birth asphyxia	40	28.5
770	Other respiratory conditions of fetus and newborn	4	2.8
771	Infections specific to the perinatal period	3	2.1
772	Fetal and neonatal hemorrhage	3	2.1
773	Hemolytic disease of fetus or newborn, due to isoimmunization	8	5.7
775	Endocrine and metabolic disturbances specific to the fetus and newborn	13	9.2
779	Other and ill-defined conditions originating in the perinatal period	275	195.6
740-779	All Causes	1,083	770.4

[1] Ninth Revision of the International Classification of Diseases.
[2] Ratios per 100,000 resident live births.

of age, 40 years of age or greater, and for the other than white fetus are higher than those for other groups (Table 1.34).

The overall fetal death rate per 1,000 total births (live births plus fetal deaths) was 7.6 in 1981. An association of maternal age with fetal death rates is apparent from Table 1.34. The 25-29 year age group displayed the lowest rate. Progressively older and younger age groups displayed increasingly higher rates. The rate for women 15-19 (9.6) was 47.7 percent higher than the rate for women 25-29 years of age (6.5). The highest rate was experienced by women under 15 years of age, for whom the rate (29.1) was over four times the rate for women in the lowest risk age group. The rate for women 40 years of age or over was over three times that for women 25-29 years of age. The median age of women whose pregnancy resulted in a fetal death was 25 years, the same as for women having live births.

In 1981 the fetal death rate for white fetuses was 6.9 while the fetal death rate for other races was 58.0 percent higher at 10.9. Rates for other than white fetuses were higher than for white fetuses in all age intervals with sufficient events to calculate rates. The differentials ranged from 11.8 percent for women aged 15 through 19 to 82.8 percent for women aged 25-29.

INTERPREGNANCY TIME PERIOD FOR FETAL DEATHS

For those women whose pregnancy terminated with a fetal death in 1981, a total of 443 reported the date of the termination of a previous pregnancy. Table 1.35 presents a comparison of fetal death rates by interpregnancy time span for births in 1981 to women who reported the date of a prior termination. The minimum risk was associated with spacings of between 3 and 5 years (3.6 fetal deaths per 1,000 total births). The risk increased progressively as the length of spacings decreased or increased. The fetal death rate for births with spacings of five or more years was 69.4 percent above the rate of the minimum risk category. The greatest risk of fetal death was associated with spacings of less than one year. For births in this category the fetal death rate (18.3) was five times the rate for the minimum risk category. When comparing interpregnancy time spans for live births and fetal deaths one should be aware that the shorter gestational period associated with fetal deaths results in a correspondingly shorter interpregnancy time span.

The median interpregnancy time period for fetal deaths was 2 years and 3 months, compared to 2 years and 6 months for women having live births in 1981.

Table 1.34
Fetal Deaths, Live Births, Total Births, and Fetal Death Rates by Age of Mother and Race of Fetus, Michigan Residents, 1981

AGE OF MOTHER AND RACE OF FETUS	FETAL DEATHS	LIVE BIRTHS	TOTAL BIRTHS	RATE PER 1,000 TOTAL BIRTHS
Under 15 Years.......	9	300	309	29.1
White..............	3	97	100	*
Other Than White...	6	202	208	28.8
Not Stated.........	-	1	1	000
15-19 Years..........	179	18,397	18,576	9.6
White..............	121	12,959	13,080	9.3
Other Than White...	57	5,420	5,477	10.4
Not Stated.........	1	18	19	000
20-24 Years..........	346	47,737	48,083	7.2
White..............	260	39,379	39,639	6.6
Other Than White...	84	8,320	8,404	10.0
Not Stated.........	2	38	40	000
25-29 Years..........	303	46,527	46,830	6.5
White..............	234	40,217	40,451	5.8
Other Than White...	67	6,283	6,350	10.6
Not Stated.........	2	27	29	000
30-39 Years..........	223	26,879	27,102	8.2
White..............	168	22,738	22,906	7.3
Other Than White...	54	4,121	4,175	12.9
Not Stated.........	1	20	21	000
40 or Over...........	15	729	744	20.2
White..............	13	573	586	22.2
Other Than White...	2	156	158	*
Not Stated.........	-	-	-	000
Not Stated...........	8	10	18	000
White..............	8	9	17	000
Other Than White...	-	1	1	000
Not Stated.........	-	-	-	000
Total................	1,083	140,579	141,662	7.6
White..............	807	115,972	116,779	6.9
Other Than White...	270	24,503	24,773	10.9
Not Stated.........	6	104	110	000

Table 1.35
Fetal Deaths, Live Births, Total Births, and Fetal Death Rates by Interpregnancy Time Span, Michigan Residents Reporting Prior Pregnancy Terminations', 1981

Time Span in Years	Fetal Deaths	Live Births	Total Births	Rate per 1,000 Total Births
Less Than One	57	3,052	3,109	18.3
1 < 2	134	27,694	27,828	4.8
2 < 3	97	21,012	21,109	4.6
3 < 5	68	18,665	18,733	3.6
5 or More	87	14,091	14,178	6.1
Total	443	84,514	84,957	5.2

'Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

Table 1.36 indicates that, as with live births (Table 1.13), the outcome of the immediate prior termination has a strong influence on the interval between pregnancies. For 144 women whose prior termination was a fetal death, the median interpregnancy time span was 1 year and 7 months. For 299 women whose prior termination was a live birth, the median interpregnancy time span was 2 years and 9 months.

As for live births, the median interpregnancy time span for fetal deaths has declined since 1977. In 1977 the median was 2 years and 11 months for fetal deaths. By 1981 the median had declined 22.9 percent, to 2 years and 3 months. For live births the decline was 9.1 percent, from 2 years and 9 months in 1977 to 2 years and 6 months in 1981.

PRENATAL CARE - FETAL DEATHS

Of the 1,083 fetal deaths reported for 1981, 67 or 6.2 percent of the reports indicated that the mother had no prenatal visits. The comparable percent for live births was 0.7. The percent of mothers with fewer than ten prenatal visits was 58.4 for fetal deaths and 24.1 for live births (Table 1.17 and Table 1.37).

The number of prenatal visits varied by race (Table 1.37). Mothers of white fetuses had a mean of 7.8 visits whereas those of other than white fetuses reported a mean of 6.5 visits. Note, however, that the number of prenatal visits was not stated on 10.2 percent of the reports for white fetuses and 21.1 percent of the reports for other than white fetuses.

The fetal death rate varied with the number of prenatal visits (Table 1.38). The rate was 67.2 for mothers with no care, 39.7 for mothers with 1-4 visits, and 13.2 for those with 5-9 visits. The fetal death rate was lowest for mothers with 10-14 visits (2.9), and increased to 3.8 and 5.6 for mothers with 15-19 and 20 or more visits, respectively.

Fetal death rates for white and other than white fetuses exhibited similar patterns of association with the number of prenatal visits (Table 1.38). The overall fetal death rate for other than white fetuses was 58.0 percent higher than for white fetuses. However, the differential by race was not uniform between prenatal care categories. The fetal death rates for white fetuses were higher than those for other than white fetuses for births to women who received no care or from 1-4 prenatal visits. For fetuses born to women who received between 5 and 19 prenatal visits, rates for other than white fetuses ranged from 5 percent to 25 percent above those for white fetuses.

Table 1.36

Fetal Deaths[1] to Women Reporting Prior Pregnancy Terminations[2] by Time Span Between Last and Current Termination and by Whether Prior Termination Resulted in a Live Birth or a Fetal Death[3], Michigan Residents, 1981

TIME SPAN IN YEARS	TOTAL		PRIOR FETAL DEATH[3]		PRIOR LIVE BIRTH	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Total................	443	100.0	144	100.0	299	100.0
Less Than One........	57	12.9	37	25.7	20	6.7
1<2..................	134	30.2	58	40.3	76	25.4
2<3..................	97	21.9	26	18.1	71	23.7
3<5..................	68	15.3	9	6.3	59	19.7
5 or More............	87	19.6	14	9.7	73	24.4
Median Time Span	2 yrs. 3 mos.	000	1 yr. 7 mos.	000	2 yrs. 9 mos.	000

[1] Deaths of fetuses of twenty or more weeks gestation or weighing 400 grams or more.

[2] Terminations with time spans of zero years (i.e., second or later births in plural deliveries) and terminations with unknown time spans are excluded.

[3] Fetal deaths of any gestational age.

Table 1.37
Fetal Deaths by Number of Prenatal Visits and Race, Michigan Residents, 1981

PRENATAL VISITS	RACE							
	TOTAL		WHITE		ALL OTHER		NOT STATED	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
None....................	67	6.2	39	4.8	28	10.4	-	-
1-4.....................	186	17.2	135	16.7	51	18.9	-	-
5-9.....................	379	35.0	295	36.6	82	30.4	2	33.3
10-14...................	243	22.4	206	25.5	35	13.0	2	33.3
15-19...................	52	4.8	43	5.3	9	3.3	-	-
20 or Over..............	15	1.4	7	0.9	8	3.0	-	-
Not Stated..............	141	13.0	82	10.2	57	21.1	2	33.3
Total...................	1,083	100.0	807	100.0	270	100.0	6	100.0
Median Number of Visits.	7	000	8	000	6	000	*	000
Mean Number of Visits...	7.5	000	7.8	000	6.5	000	*	000

Table 1.38
Fetal Deaths, Total Births and Fetal Death Rates by Number of Prenatal Visits and Race[1] Michigan Residents, 1981

NUMBER OF VISITS	ALL BIRTHS			WHITE BIRTHS			ALL OTHER BIRTHS		
	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES	FETAL DEATHS	TOTAL BIRTHS	FETAL DEATH RATES
Total	1,083	141,662	7.6	807	116,779	6.9	270	24,773	10.9
None	67	997	67.2	39	522	74.7	28	472	59.3
1-4	186	4,689	39.7	135	2,901	46.5	51	1,786	28.6
5-9	379	28,806	13.2	295	22,784	12.9	82	6,009	13.6
10-14	243	84,047	2.9	206	73,940	2.8	35	10,076	3.5
15-19	52	13,801	3.8	43	11,585	3.7	9	2,210	4.1
20 or Over	15	2,679	5.6	7	1,994	3.5	8	683	11.7
Not Stated	141	6,643	000	82	3,053	000	57	3,537	000

[1] Race not stated included in total columns only.

Caution should be exercised in interpreting the above fetal death rates and proportions. Incomplete reporting of the number of visits occurred on 13.0 percent of the fetal death reports compared with 4.6 percent of the live birth records. It should also be kept in mind that fetal deaths are much more likely to occur preterm and this affects the possible number of prenatal visits (Table 1.39). In 1981 29.3 percent of the reported fetal deaths occurred before 28 weeks of gestational age, and 55.3 percent occurred before 36 weeks. Incomplete reporting of gestational age occurred on an additional 10.2 percent of the fetal death reports.

The month of pregnancy that prenatal care began was most frequently the second month (Table 1.40). Two thirds (64.5 percent) of all fetal deaths were to women who reported receiving care prior to the fourth month of pregnancy, and 78.0 percent were to women receiving care prior to the sixth month. From 1970 through 1973 there were increases in the percentage of fetal deaths in which the mother received care prior to the fourth and sixth month. These percentages declined between 1973 and 1976, and increased between 1976 and 1981 (Figure 1.11).

FETAL WEIGHT

Among live births, the percent of infants weighing 2,500 grams or less at birth was 6.9. The comparable percent among fetal deaths was 68.1. The distribution of fetal weight by plurality for fetal deaths is presented in Table 1.41. Note that twin and triplet deliveries are not sets, but are total occurrences and that any given set may have included live births. The percent of single delivery fetal deaths under 2,501 grams was 66.6. The comparable percent for twin deliveries was 86.3.

The fetal weight distribution is strongly associated with gestational age (Table 1.42). The median fetal weight for all fetal deaths was 1,332 grams compared to a median birthweight of 3,400 grams for live births. For deaths of fetuses of 32-35 weeks age, the median was 1,587 grams, while for the normal gestational age range of 36-39 weeks the median weight was only 2,664 grams.

Table 1.39
Fetal Deaths by Gestational Age and Number of Prenatal Visits, Michigan Residents, 1981

GESTATIONAL AGE IN COMPLETED WEEKS	NUMBER	PERCENT	MEDIAN NUMBER OF VISITS
Under 20	43	4.0	3
20-23	122	11.3	4
24-27	152	14.0	5
28-31	118	10.9	6
32-35	164	15.1	8
36-39	205	18.9	10
40-43	143	13.2	11
44 or More	26	2.4	12
Unknown	110	10.2	3
Total	1,083	100.0	7

Table 1.40
Fetal Deaths by Month Prenatal Care Began and Number of Prenatal Visits, Michigan Residents, 1981

MONTH OF PREGNANCY PRENATAL CARE BEGAN	NUMBER OF VISITS							
	TOTAL	NONE	<5	5-9	10-14	15-19	20 AND OVER	NOT STATED
TOTAL..............	1,083	67	186	379	243	52	15	141
No Care............	67	67	-	-	-	-	-	-
First Month.........	100	-	12	46	24	8	5	5
Second Month........	366	-	52	156	109	27	9	13
Third Month.........	233	-	43	91	77	12	1	9
Fourth Month........	97	-	25	47	16	4	-	5
Fifth Month.........	49	-	20	16	11	1	-	1
Sixth Month.........	27	-	12	11	2	-	-	2
Seventh Month.......	15	-	8	6	1	-	-	-
Eighth Month........	7	-	4	3	-	-	-	-
Ninth Month.........	5	-	5	-	-	-	-	-
Unknown............	117	-	5	3	3	-	-	106

Figure 1.11 Percent of Women Having Fetal Deaths Who Received Care Prior to the 4th Month and the 6th Month of Pregnancy, Michigan Residents, 1970-1981

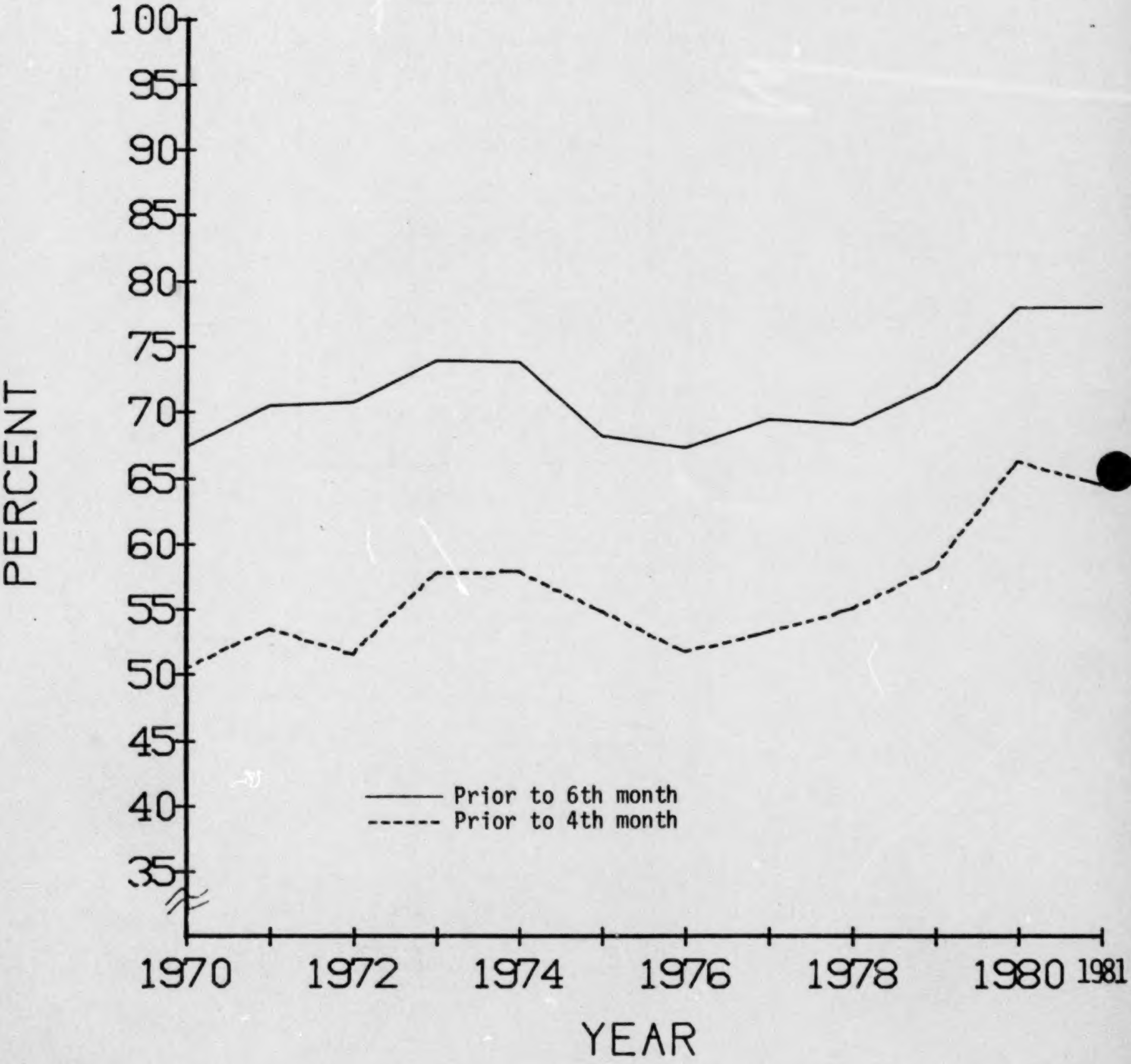


Table 1.41
Fetal Deaths by Fetal Weight and Plurality, Michigan Residents, 1981

WEIGHT	FETAL DEATHS[1]	CUM. PERCENT	SINGLE DELIVERY	TWIN DELIVERY	TRIPLET DELIVERY
500 Grams or Less.......	197	18.2	167	24	3
501-1,000 Grams..........	256	41.8	240	15	1
1,001-1,500 Grams.......	108	51.8	99	8	1
1,501-2,000 Grams.......	96	60.7	89	7	-
2,001-2,500 Grams.......	81	68.2	72	9	-
2,501-3,000 Grams.......	114	78.7	110	4	-
3,001-3,500 Grams.......	96	87.6	93	3	-
3,501-4,000 Grams.......	66	93.7	66	-	-
4,001-4,500 Grams.......	22	95.7	22	-	-
4,501-5,000 Grams.......	7	96.3	7	-	-
5,001 Grams and Over....	8	97.0	8	-	-
Not Stated.............	32	100.0	29	3	-
Total..................	1,083	100.0	1,002	73	5

[1] Total includes 3 fetal deaths of a set of sextuplets born in 1981. Each of the 3 weighed 500 grams or less.

Table 1.42
Fetal Deaths by Fetal Weight and Gestational Age, Michigan Residents, 1981

FETAL WEIGHT IN GRAMS	GESTATIONAL AGE IN COMPLETED WEEKS									
	TOTAL	UNDER 20	20-23	24-27	28-31	32-35	36-39	40-43	44 OR MORE	UNKNOWN
Less than 1501	561	41	117	144	95	72	20	3	-	69
1501-2500	177	1	-	3	15	51	59	28	6	14
2501 and over	313	1	2	2	2	35	120	110	20	21
Unknown	32	-	3	3	6	6	6	2	-	6
Total	1,083	43	122	152	118	164	205	143	26	110
Median[1]	1,332	480	480	652	850	1,587	2,664	3,288	3,061	750

[1] Excluding unknown fetal weight.

MORTALITY

SECTION II

MORTALITY: AN OVERVIEW 1981

RESIDENT DEATHS	75,818
CRUDE DEATH RATE	8.2
INFANT DEATHS	1,851
INFANT DEATH RATE	13.2
NEONATAL DEATHS	1,281
NEONATAL DEATH RATE	9.1
PERINATAL DEATHS	2,194
PERINATAL DEATH RATE	15.5
MATERNAL DEATHS	7
MATERNAL DEATH RATE	0.5
DEATHS FROM HEART DISEASE PER DAY	83
DEATHS FROM CANCER PER DAY	44
DEATHS FROM STROKE PER DAY	17
DEATHS FROM ACCIDENTS PER DAY	9
MEDIAN AGE AT DEATH	72 years
MEDIAN AGE AT DEATH FOR MALES	69 years
MEDIAN AGE AT DEATH FOR FEMALES	76 years

MORTALITY: AN OVERVIEW 1981

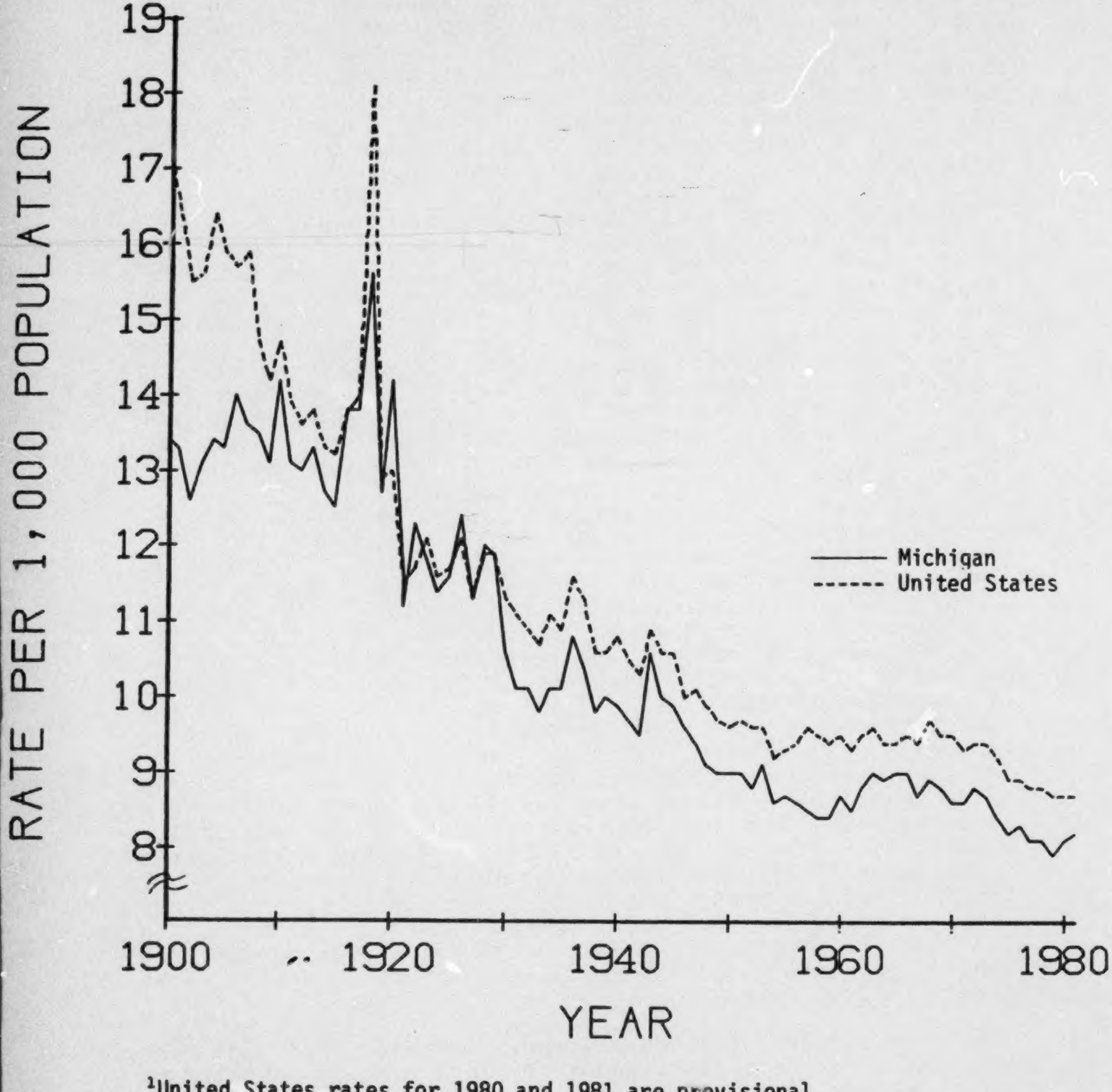
In 1981 there were 75,818 deaths recorded for Michigan residents, 827 more than in the previous year. The crude death rate per 1,000 population increased from 8.1 in 1980 to 8.2 in 1981. The age-adjusted death rate decreased by 0.8 percent. Age-adjusted death rates control for differences or variations in the age composition of the population, and are thus better indicators than crude death rates for showing changes in the risk of dying over a period of time or differences between sex-race groups. See the Technical Notes for method of calculation.

Between 1900 and 1981 the number of deaths occurring to Michigan residents increased from 32,453 to 75,818. The 31,472 deaths recorded in 1902 was the lowest number of resident deaths in this century, while the greatest number was recorded in 1972 when total resident deaths numbered 79,210. Although the total number of deaths increased between 1900 and 1981, the increase is due to an increasing population. The crude death rate decreased from 13.4 (per 1,000 population) in 1900 to 8.2 in 1981. The 1979 death rate of 7.9 was the lowest crude death rate ever recorded for Michigan. The highest death rate (15.6) was observed in 1918 (Figure 2.1).

A comparison of deaths and crude death rates for Michigan and the United States for the period 1970-1981 is presented in Table 2.1. As Michigan's population is somewhat "younger" than that of the nation, the Michigan rate has consistently been below the United States rate. Both Michigan and national rates were relatively stable between 1970 and 1973, declined in 1974 and 1975, and have remained quite stable since 1975. Between 1970 and 1981 the number of Michigan resident deaths declined by 0.7 percent, and the crude death rate declined by 4.7 percent. The decline in the age-adjusted death rate was a more dramatic 19 percent (Table 2.6). Over the period 1970-1980 the age-adjusted death rate for the nation declined by a similar amount, 17 percent. Between 1970 and 1978 the age-adjusted death rates of Michigan were slightly higher than those of the United States, with the exception of 1974 when Michigan's rate was 0.8 percent below the national rate. In 1979 and 1980 Michigan's age-adjusted rates were 0.6 percent and 1.0 percent, respectively, below the United States rates (See Technical Notes).

The numbers of deaths by marital status and age for men and women are displayed in Table 2.2. The majority of men were married at the time of death while the majority of women were widows. Men were twice as likely as women to be married at the time of death (60.1 percent compared to 29.6 percent). Conversely, women were over three times as likely to be widows at the time of death as men were to be widowers

FIGURE 2.1 CRUDE DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS, 1900-1981[1]



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[1] United States rates for 1980 and 1981 are provisional.

Table 2.1
Number of Deaths and Crude Death Rates, Michigan and United States Residents, 1970-1981

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
1,921,031	9.5	1970	76,321	8.6
1,927,542	9.3	1971	77,395	8.6
1,963,944	9.4	1972	79,210	8.8
1,973,003	9.4	1973	78,522	8.7
1,934,388	9.2	1974	76,143	8.4
1,892,879	8.9	1975	74,522	8.2
1,909,440	8.9	1976	75,801	8.3
1,899,597	8.8	1977	74,144	8.1
1,927,788	8.8	1978	74,773	8.1
1,913,841	8.7	1979	73,480	7.9
1,986,000Pr.	8.7Pr.[1]	1980	74,991	8.1
1,987,000Pr.	8.7Pr.	1981	75,818	8.2

[1] The rate for 1980 for the United States was revised using a population estimate based on the 1980 census enumeration.

Table 2.2
Deaths by Age, Sex, and Marital Status, Michigan Residents, 1981

AGE IN YEARS	MALES						FEMALES					
	TOTAL	NEVER MARRIED	DIVORCED	WIDOWER	MARRIED[1]	UNKNOWN	TOTAL	NEVER MARRIED	DIVORCED	WIDOW	MARRIED[1]	UNKNOWN
Under 15	1,475	1,475	-	-	-	-	1,112	1,112	-	-	-	-
15-24	1,160	1,024	17	3	114	2	407	321	12	2	72	-
25-34	1,429	564	247	4	612	2	614	203	114	9	287	1
35-44	1,509	251	329	21	905	3	855	107	173	35	539	1
45-54	3,234	353	542	87	2,242	10	1,985	140	330	187	1,327	1
55-64	7,339	629	824	437	5,421	28	4,407	218	498	1,077	2,610	4
65-74	10,303	697	747	1,364	7,451	44	7,030	345	466	3,307	2,901	11
75-84	9,641	619	419	2,590	5,982	31	9,687	504	366	6,771	2,033	13
85+	5,011	349	122	2,563	1,960	17	8,602	535	206	7,342	511	8
Unknown	6	4	1	-	1	-	1	1	-	-	-	-
All Ages	41,107	5,965	3,248	7,069	24,688	137	34,700	3,486	2,165	18,730	10,280	39

[1] Includes legally separated.

(54.0 percent compared to 17.2 percent). Among males, 14.5 percent had never been married, while the corresponding figure for females was 10.0 percent. Men were also more likely to be divorced (7.9 percent compared to 6.2 percent).

Table 2.3 presents data on the number of deaths by race for the period 1970-1981. The number of deaths of white persons declined by 2.5 percent over the decade while deaths of black persons increased by 14.0 percent. Reported deaths of American Indians and persons of other races remained fairly constant. It should be noted that data on race are derived from the death certificates filed by funeral directors. Data from sources where race is self-enumerated, when matched with death data, indicate larger numbers of American Indians and persons of other races than reported as members of those groups on the death certificate.[1] In 1981 deaths of white persons numbered 65,559 and accounted for 86.5 percent of all deaths, while deaths of black persons constituted 13.1 percent of the state total.

Michigan resident deaths in 1981 are tabulated by age, race, and sex in Table 2.4. Of the 75,818 Michigan resident deaths that occurred in 1981, 41,107 (54.2 percent) occurred to males and 34,700 occurred to females (11 records had sex not stated). The median age at death for males was 69 years, compared to a significantly higher figure of 76 years for females. The median age at death was 73 years for whites, compared to 63 years for persons of other races.

In 1981, 25,533 or 33.7 percent of all deaths occurred to persons under the age of 65. The proportion dying under age 65 was greater for males than females and greater for other than white persons than for white persons. For deaths of white persons 36.3 percent of males and 24.1 percent of females died before age 65. For deaths of other than white persons 57.5 percent of males and 47.5 percent of females died before age 65.

Unadjusted, age-specific, and age-adjusted death rates by race and sex are presented in Table 2.5. The unadjusted rate for males of 910.2 was 25 percent above that for females while the age-adjusted rate for males was 74 percent higher. The population subgroup with the lowest unadjusted death rate was other than white females (586.8) and the highest unadjusted rate was experienced by white males (920.7). Age-adjusting the data results in a quite different relationship, however, with the age-adjusted rate being lowest for white females and highest for other than

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[1] National Center for Health Statistics, Comparability of Marital Status, Race, Nationality and Country of Origin in the Death Certificate and Matching Census Record: United States, May - August, 1960 (Washington, D.C., 1969).

Table 2.3
Number of Deaths by Race[1], Michigan Residents, 1970-1981

YEAR	ALL RACES	WHITE	BLACK	AMERICAN INDIAN	OTHER[2]
1970	76,321	67,270	8,731	127	54
1971	77,395	67,847	9,259	128	45
1972	79,210	69,598	9,409	126	40
1973	78,522	68,502	9,641	121	54
1974	76,143	66,600	9,233	128	58
1975	74,522	65,191	9,024	118	60
1976	75,801	66,334	9,146	125	70
1977	74,144	64,816	9,038	140	53
1978	74,773	65,149	9,254	152	72
1979	73,480	63,955	9,188	129	75
1980	74,991	64,897	9,704	137	93
1981	75,818	65,559	9,950	127	78

[1] Deaths with race not stated included in total column only. Persons of Spanish or of Mexican-American descent are included with white.

[2] Includes Chinese, Japanese, Filipino, Hawaiian, other Asian or Pacific Islander. Indians from India were counted as "White" from 1970-1977 and with "Other" since 1978.

Table 2.4
Number of Deaths by Age, Race, and Sex[1], Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	1851	1037	807	1261	714	541	582	319	262	8	4	4
1-4	309	179	130	230	138	92	79	41	38	-	-	-
5-9	187	108	79	142	85	57	45	23	22	-	-	-
10-14	247	151	96	195	122	73	51	28	23	1	1	-
15-19	638	467	171	543	396	147	95	71	24	-	-	-
20-24	929	693	236	719	538	181	207	152	55	3	3	-
25-29	991	729	262	667	494	173	323	235	88	1	-	1
30-34	1052	700	352	648	444	204	400	253	147	4	3	1
35-39	1092	702	390	774	497	277	316	204	112	2	1	1
40-44	1272	807	465	957	607	350	313	199	114	2	1	1
45-49	1905	1174	731	1492	914	578	407	256	151	6	4	2
50-54	3314	2060	1254	2652	1657	995	658	399	259	4	4	-
55-59	5109	3213	1896	4189	2661	1528	908	541	367	12	11	1
60-64	6637	4126	2511	5611	3517	2094	1017	604	413	9	5	4
65-69	8275	5079	3194	7146	4400	2744	1116	668	448	13	11	2
70-74	9060	5224	3836	7984	4629	3355	1066	587	479	10	8	2
75-79	10001	5305	4695	9029	4796	4232	964	506	458	8	3	5
80-84	9329	4336	4992	8548	3953	4595	771	376	394	10	7	3
85-89	8017	3208	4809	7510	2992	4518	499	211	288	8	5	3
90+	5596	1803	3793	5256	1693	3563	337	110	227	3	-	3
Not Stated	7	6	1	6	5	1	1	1	-	-	-	-
All Ages	75818	41107	34700	65559	35252	30298	10155	5784	4369	104	71	33
Median Age At Last Birthday	72	69	76	73	70	77	63	61	66	64	62	69

[1] The deaths of 9 white and 2 other than white persons with sex not stated are included only in the total columns.

Table 2.5
Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	817.9	910.2	730.1	837.0	920.7	756.8	713.0	851.1	586.8
Under 1 Year	1315.6	1450.2	1175.6	1126.1	1250.7	995.7	2077.7	2268.2	1885.6
1-14 Years	36.8	42.5	31.0	35.2	41.7	28.2	43.6	45.6	41.7
15-24 Years	88.7	131.6	46.0	85.3	125.8	44.4	107.0	163.2	54.3
25-34 Years	129.9	184.1	77.0	100.0	142.8	57.4	284.6	415.8	171.8
35-44 Years	223.6	291.2	158.6	190.7	246.1	136.5	427.3	586.1	288.1
45-54 Years	573.1	731.4	423.7	524.3	665.0	389.4	900.0	1204.5	640.7
55-64 Years	1344.8	1771.7	959.7	1270.4	1687.1	893.6	1915.0	2427.0	1461.2
65-74 Years	3062.3	4134.6	2218.9	3003.2	4076.8	2160.1	3545.3	4603.3	2702.6
75-84 Years	6858.2	9051.7	5525.3	6884.8	9152.3	5527.1	6599.2	8161.6	5506.7
85 Years and Over	16055.1	19081.1	14695.9	16302.7	19438.6	14906.4	13038.1	15046.7	12037.3
Age-Adjusted Rate[2]	583.4	763.8	438.5	556.6	731.8	417.0	748.3	965.9	568.4

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

white males.

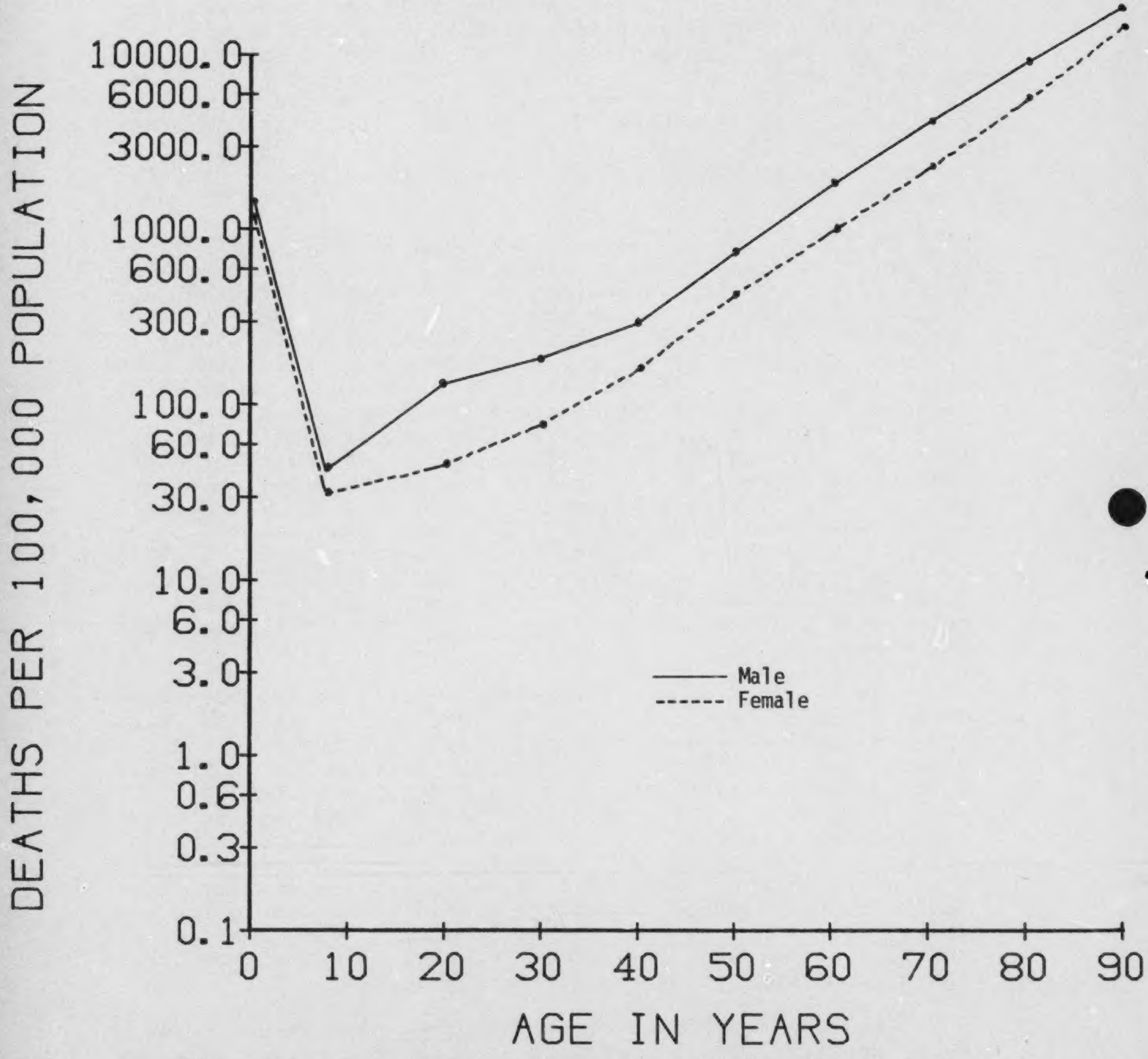
The age-specific death rates for all males and all females displayed in Figure 2.2 indicate a similar pattern. The rates for both sexes declined from birth to a low for ages 1-14 years. The rate for 15-24 year olds was much higher than for 1-14 year olds in both sexes (3.1 and 1.5 times as high, respectively, for males and females). The rates for both sexes rose persistently through the terminal age group (85 years and over). The rates for males were consistently above those for females with the greatest relative differential occurring in the age group 15-24 years, where the rate for males was 2.9 times that for females.

A comparison by race of 1981 age-specific death rates for males is graphically presented in Figure 2.3. Rates for males of both races increased dramatically from the age group 1-14 years to the age group 15-24 years. Between ages 15-24 and 25-34 the rate for white males increased by 14 percent, while the corresponding increase for other than white males was 155 percent. Rates for other than white males were above those for white males at all ages prior to 75 years. The largest relative differential was for persons from 25 through 34 years of age, where the rate for other than white males was 2.9 times that of white males. Beyond age 74 the rates for white males were higher. The overall death rate of 851.1 per 100,000 for other than white males was 8 percent below the rate for white males (920.7). This is a reflection of the younger age distribution of the other than white male population. The age-adjusted death rate for other than white males was 32 percent higher than that for white males.

Rates for other than white females were higher than those for white females at all ages prior to 75 years (Figure 2.4). For infants under the age of one year and for women from 25 through 64 years, the rate for other than white females ranged between 1.6 and 3.0 times the rate for white females. The death rate for all ages was 756.8 for white females and 586.8 for other than white females, reflecting the greater concentration of the white female population in the older age intervals with relatively high death rates. After adjusting for differences in the age distributions of the populations, the rate for other than white females was 36 percent greater than that for their white counterparts.

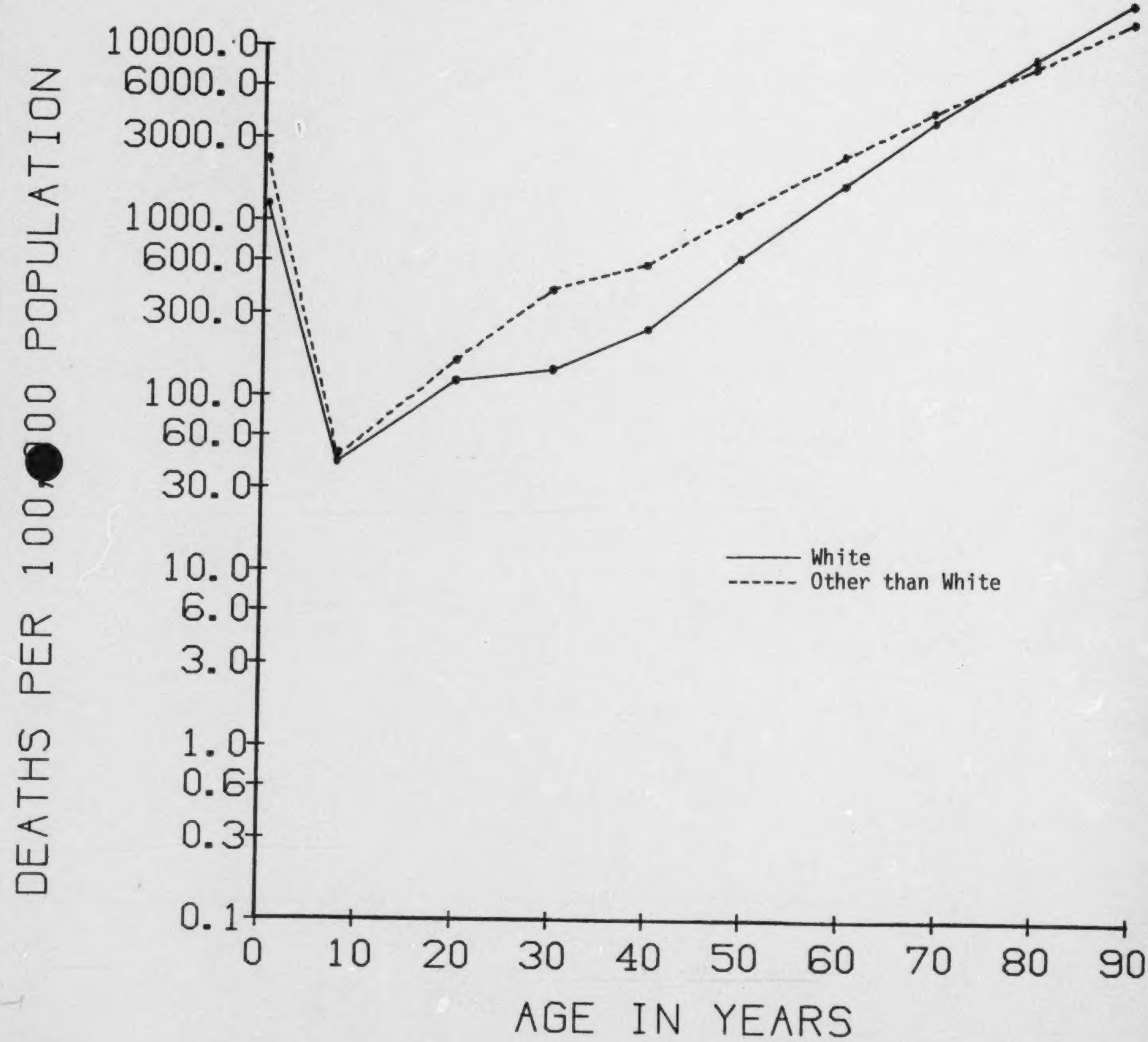
Age-adjusted death rates for other than white persons were considerably higher than comparable rates for white persons throughout the period 1970-1981 (Table 2.6). Age-adjusted rates for other than white males ranged between 28 percent (in 1978) and 39 percent (in 1973) higher than comparable rates for white males in Michigan. For females

FIGURE 2.2 AGE-SPECIFIC DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.3 AGE-SPECIFIC DEATH RATES[1] BY RACE, MICHIGAN RESIDENT MALES, 1981



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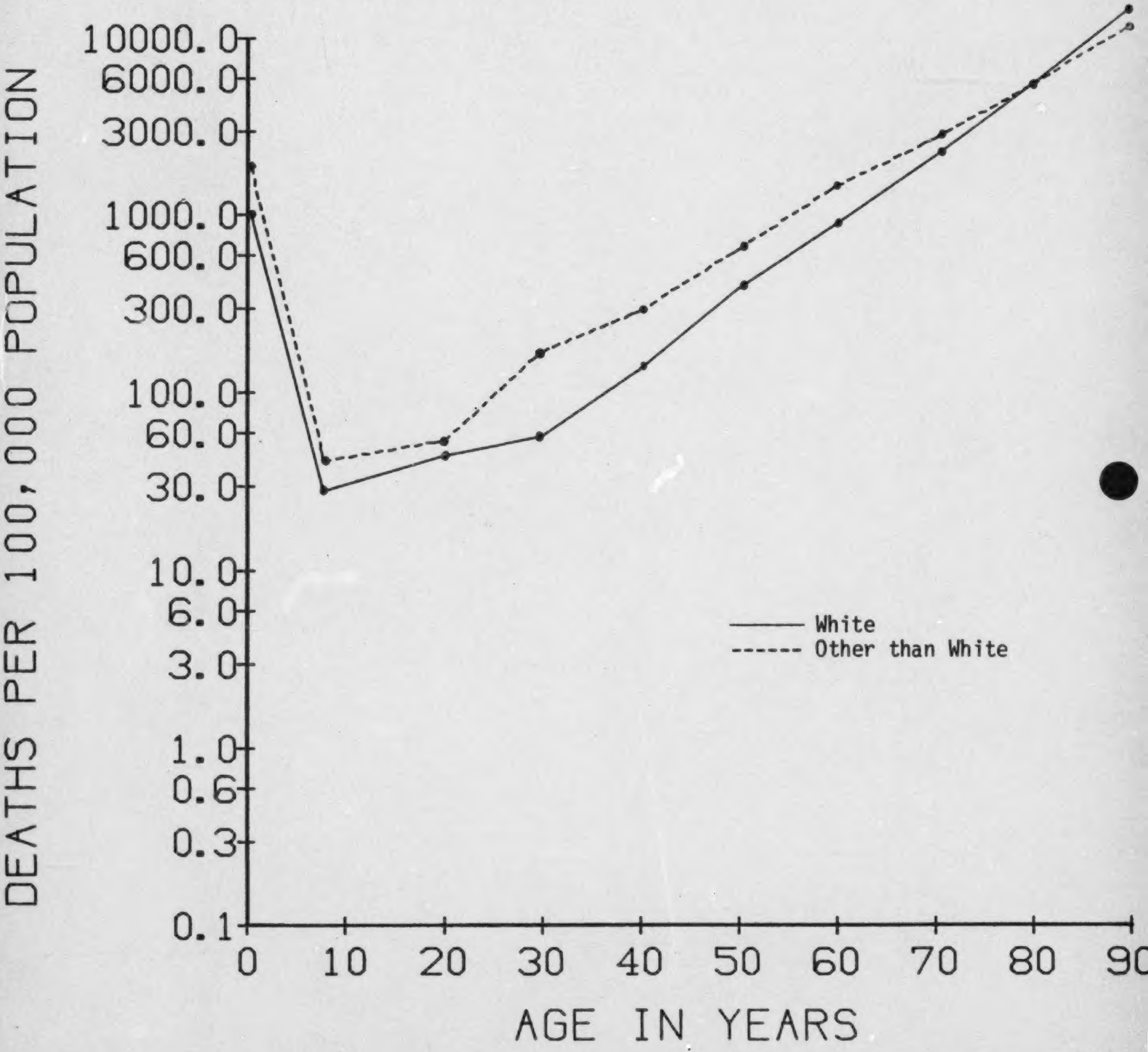
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.4 AGE-SPECIFIC DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1981



[1]Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

Table 2.6
Age-Adjusted Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	717.5	925.9	537.3	685.5	889.4	510.8	961.5	1201.7	744.8
	1971	707.9	922.9	524.0	673.0	881.9	496.0	962.4	1216.4	734.5
	1972	711.1	928.2	526.4	678.1	889.3	500.0	942.5	1203.3	711.0
	1973	694.3	906.3	513.7	659.7	864.5	486.9	932.3	1198.7	697.8
	1974	660.7	865.1	488.0	630.0	826.9	465.3	864.5	1123.4	637.7
	1975	640.2	840.3	472.4	612.0	803.2	453.4	822.5	1087.4	592.3
	1976	636.1	838.5	469.1	609.4	804.5	450.0	808.8	1062.8	590.5
	1977	614.3	814.8	449.4	589.8	785.1	430.5	774.0	1008.6	574.0
	1978	606.3	797.8	449.8	581.5	769.7	428.7	767.8	981.7	587.2
	1979	585.4	775.5	431.5	561.0	746.8	411.9	739.9	960.2	554.8
	1980	588.0	773.9	438.7	560.3	740.1	417.1	761.0	993.1	569.4
	1981	583.4	763.8	438.5	556.6	731.8	417.0	748.3	965.9	568.4
U.S.	1970	714.3	931.6	532.5	679.6	893.4	501.7	983.4	1231.4	770.8
	1971	699.9	915.7	521.1	665.8	878.4	490.9	963.6	1210.7	754.9
	1972	701.8	921.9	520.0	667.6	883.2	490.8	955.4	1227.2	745.0
	1973	692.9	911.7	513.1	659.3	874.1	483.7	953.1	1206.7	738.9
	1974	666.2	877.8	492.9	635.4	843.0	466.4	901.3	1149.1	693.1
	1975	638.3	845.3	469.3	609.8	812.7	445.3	852.4	1097.5	648.3
	1976	627.5	830.2	462.9	599.9	798.8	439.6	833.7	1072.1	635.1
	1977	612.3	811.9	450.6	585.4	781.5	427.8	814.0	1045.9	621.3
	1978	606.1	802.8	447.0	580.2	773.1	425.5	797.6	1029.6	605.5
	1979	588.8	780.3	433.5	563.4	751.1	412.2	776.3	1002.3	589.2
	1980	594.1[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Provisional.

this differential is even greater with the rate for other than white women exceeding that for white women by 31 to 48 percent.

Declines have occurred since 1970 both in Michigan and the United States in age-adjusted death rates in each race-sex subgroup. Michigan's age-adjusted rate for the population as a whole declined by 19 percent between 1970 and 1981 while the estimated decline between 1970 and 1980 for the United States was 17 percent (See Technical Notes). Relative declines in both Michigan and the United States were slightly greater for the other than white population. Although age-adjusted rates for white males and females in Michigan are comparable to rates for these groups observed nationally, the rates for other than white males and females in Michigan have generally been somewhat below those for the nation in the past several years.

LEADING CAUSES OF DEATH

Deaths assigned to the 10 leading causes accounted for 85.5 percent of all deaths in 1981. Causes of death since 1979 are classified according to the Ninth Revision International Classification of Diseases (ICD-9) published by the World Health Organization. The cause-of-death ranking procedure used in Michigan is identical to that used by the National Center for Health Statistics (NCHS). It is based on a "List of 72 Selected Causes of Death," which NCHS constructed by combining titles in the "List of 282 Selected Causes of Death." This latter list, which is also used in this publication, was constructed by aggregating the detailed titles of ICD-9.

The numbers of deaths and the death rates for the 10 leading causes for 1981 are shown in Table 2.7, and the percentage of total deaths resulting from each of these causes is illustrated in Figure 2.5. The ranking of the 10 leading causes for 1981 was similar to that for 1980. The only change was in the causes ranked 8th and 9th. In 1980 chronic liver disease and cirrhosis was ranked 8th and atherosclersis was ranked 9th. In 1981 the order of these two causes was reversed. Crude death rates in Michigan were higher in 1981 than in 1980 for six of the ten leading causes. The rates were lower in 1981 for deaths due to cerebrovascular disease, accidents and adverse effects, pneumonia and influenza, and chronic liver disease and cirrhosis.

The order of the 10 leading causes for the United States in 1981 was similar to that for Michigan. The only difference was in the order of the causes ranked 8th and 9th. Certain differences between the United States figures and those of Michigan should be noted. The overall Michigan death rate was significantly lower than the national rate. Michigan's rates for diabetes mellitus, chronic liver disease and cirrhosis, atherosclerosis, and suicide, however, were higher than comparable national rates (Table 2.7).

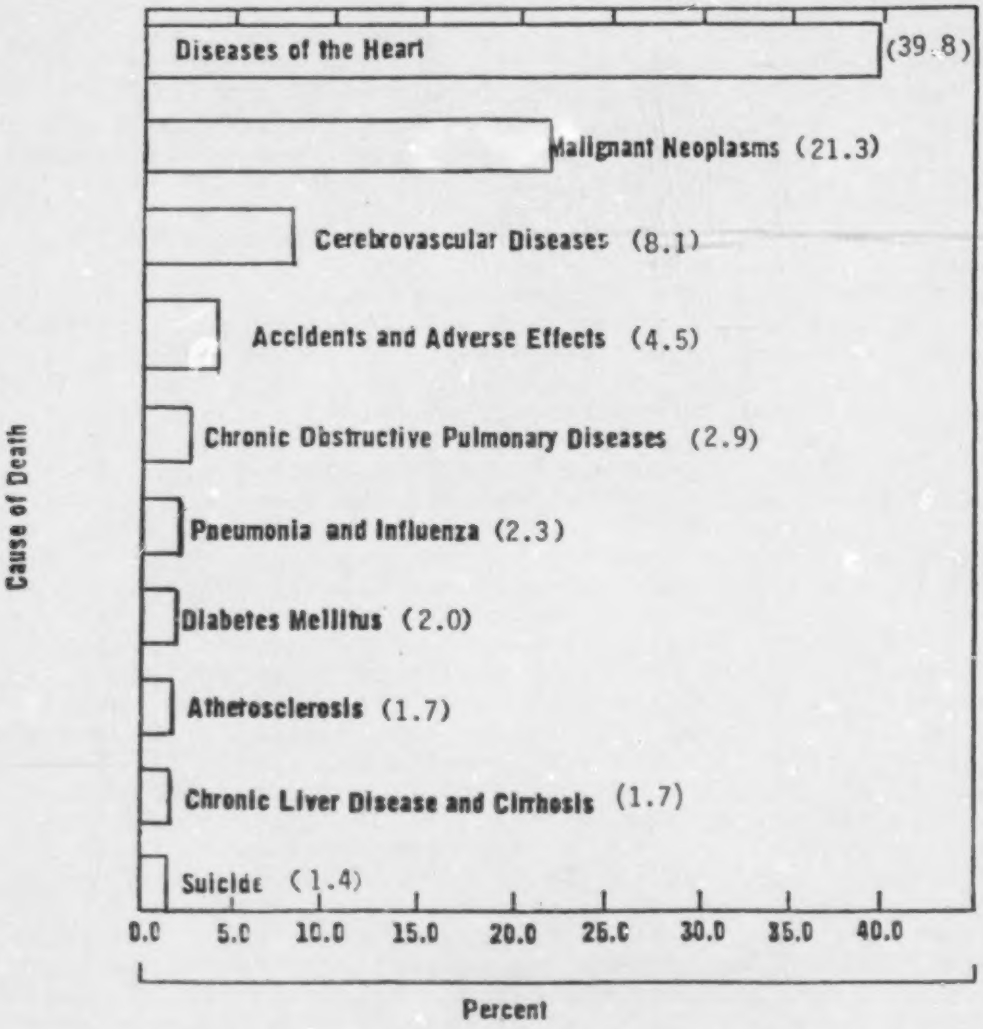
During the years 1968-1978 the Eighth Revision International Classification of Diseases, Adapted for Use in the United States (ICDA-8) was used to classify causes of death. The introduction of the Ninth Revision in 1979 resulted in a change in the ranking of the 10 leading causes between 1978 and 1979. The ranking of the four leading causes of death, heart disease, cancer, stroke, and accidents, has not changed. However, the fifth leading cause of death since 1979, chronic obstructive pulmonary diseases and allied conditions, is a new category, comparable to the Eighth Revision categories of bronchitis, emphysema, asthma, and chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema. This

Table 2.7
Leading Causes of Death and Cause-Specific Rates, Michigan and United States Residents, 1981

RANK	CAUSE OF DEATH	NUMBER OF DEATHS		RATE	
		MICHIGAN	U.S.[1]	MICHIGAN	U.S.[1]
1	Diseases of the Heart	30,172	758,100	325.5	330.6
2	Malignant Neoplasms	16,142	422,720	174.1	184.3
3	Cerebrovascular Diseases	6,121	164,330	66.0	71.7
4	Accidents and Adverse Effects	3,390	102,130	36.6	44.5
5	Chronic Obstructive Pulmonary Diseases and Allied Conditions	2,203	59,870	23.8	26.1
6	Pneumonia and Influenza	1,716	54,420	18.5	23.7
7	Diabetes Mellitus	1,487	34,750	16.0	15.2
8	Atherosclerosis	1,270	28,750	13.7	12.5
9	Chronic Liver Disease and Cirrhosis	1,253	29,520	13.5	12.9
10	Suicide	1,074	28,100	11.6	12.3
	Sub Total	64,828	1,682,690	699.3	733.8
	All Other Causes	10,990	304,310	118.6	132.6
	Total	75,818	1,987,000	817.9	866.4

[1] United States data are estimates based on a 10 percent sample of deaths.

FIGURE 2.5 - Leading Causes of Death, Michigan Residents, 1981



latter category was used increasingly by physicians during the 1970's in preference to more specific categories. During the years in which the Eighth Revision was used, bronchitis, emphysema, and asthma were grouped together for purposes of ranking, and chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema was not used in ranking. The causes ranked 6th to 10th since 1979 are the same as the causes ranked 5th to 9th in 1978, although the order is slightly different in 1981. The 10th leading cause of death in 1978, homicide, is no longer ranked among the top 10. The number of homicides in 1981 was 938.

Table 4.8 shows the numbers of deaths and death rates for several major causes for each year during this century. There has been no change in the ranking of the four leading causes since 1950. From 1950 through 1978 the ranks of 5th and 6th were held by diabetes mellitus and pneumonia and influenza, with pneumonia and influenza ranking 5th in 19 of the 29 years. For the past seven years pneumonia and influenza has ranked above diabetes. Atherosclerosis, previously termed arteriosclerosis, has consistently been among the ten leading causes of death, ranking 7th in 1950 and 8th in 1981. The 9th leading cause of death in 1981, chronic liver disease and cirrhosis (formerly titled cirrhosis of the liver) was not among the ten leading causes of death in 1950. This cause ranked 10th in 1954 and has been among the ten most frequent causes consistently since 1960. It was the 7th leading cause each year from 1969 through 1978. Suicide, the 10th leading cause in 1981, first ranked in the top ten in 1964 when it was the 10th leading cause. In 1981, seven of the ten leading causes of death were chronic conditions, one was an acute disease category, and two were external non-disease groupings.

While the most frequent causes of death among all Michigan residents have changed little in recent years, this does not imply similarity in the leading causes of death among residents at different ages, of different sexes or different races. Table 2.8 presents the five most frequent causes of death by age, sex and race. Careful examination of this table will disclose that major differences in the leading causes of death are associated with these three characteristics. No single cause of death is among the most frequent causes in all categories. Heart disease, malignant neoplasms and accidents have the most widespread significance, being present respectively in 29, 26, and 24 of the 32 age-sex-race groupings. The variation in leading causes of death by age is most evident among deaths to infants under one year. This category has little similarity to any other age group. External causes of death, including accidents, suicide and homicide, are predominant killers among persons 1 through 34 years of age. Among persons 35 years and over, chronic conditions are responsible for the majority of deaths.

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981

TOTAL POPULATION'

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
All Ages	1. Diseases of the Heart	30,172	325.5
	2. Malignant Neoplasms	16,142	174.1
	3. Cerebrovascular Diseases	6,121	66.0
	4. Accidents	3,390	36.6
	5. Chronic Obstructive Pulmonary Diseases and Allied Conditions	2,203	23.8
	All Causes	75,818	817.9
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	1,021	725.7
	2. Congenital Anomalies	322	228.9
	3. Accidents	41	29.1
	4. Diseases of the Heart	32	22.7
	5-6. Meningitis - Pneumonia and Influenza	16	11.4
	All Causes	1,851	1,315.6
1-4 Years	1. Accidents	132	23.8
	2. Congenital Anomalies	38	6.8
	3. Malignant Neoplasms	24	4.3
	4. Homicide	20	3.6
	5. Diseases of the Heart	13	2.3
	All Causes	309	55.7
5-14 Years	1. Accidents	213	14.6
	2. Malignant Neoplasms	76	5.2
	3. Homicide	26	1.8
	4. Diseases of the Heart	15	1.0
	5. Congenital Anomalies	14	1.0
	All Causes	434	29.7
15-24 Years	1. Accidents	722	40.9
	2. Homicide	229	13.0
	3. Suicide	211	12.0
	4. Malignant Neoplasms	99	5.6
	5. Diseases of the Heart	47	2.7
	All Causes	1,567	88.7
25-34 Years	1. Accidents'	583	37.1
	2. Homicide	289	18.4
	3. Suicide	249	15.8
	4. Malignant Neoplasms	210	13.3
	5. Diseases of the Heart	153	9.7
	All Causes	2,043	129.9

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

TOTAL POPULATION[1]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
35-49 Years	1. Diseases of the Heart	1,094	73.2
	2. Malignant Neoplasms	1,087	72.7
	3. Accidents	478	32.0
	4. Chronic Liver Disease and Cirrhosis	249	16.7
	5. Suicide	229	15.3
	All Causes	4,269	285.7
50-64 Years	1. Diseases of the Heart	5,678	421.5
	2. Malignant Neoplasms	4,924	365.5
	3. Cerebrovascular Diseases	738	54.8
	4. Chronic Liver Disease and Cirrhosis	557	41.3
	5. Accidents	450	33.4
	All Causes	15,060	1,118.0
65 and Over	1. Diseases of the Heart	23,136	2,480.4
	2. Malignant Neoplasms	9,718	1,041.8
	3. Cerebrovascular Diseases	5,113	548.2
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	1,741	186.6
	5. Pneumonia and Influenza	1,423	152.[illegible]
	All Causes	50,278	5,390.2

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[1] Subtotals by sex and race do not add to the grand total as the race was not stated on records for 71 males and 33 females. In addition, the sex was not stated on 9 records for white and 2 records for other than white persons. Age groups do not add to respective totals because records with age not stated are included only in the total.

[2] Rates may not agree with those shown elsewhere in this section since records of unknown sex and race were randomly allocated prior to rate calculation for the other tables, and were not included in calculations for this table.

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

WHITE MALES[2]

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
All Ages	1. Diseases of the Heart	14,674	382.6
	2. Malignant Neoplasms	7,390	192.7
	3. Cerebrovascular Diseases	2,180	56.8
	4. Accidents	2,065	53.8
	5. Chronic Obstructive Pulmonary Diseases and Allied Conditions	1,387	36.2
	All Causes	35,252	919.1
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	376	652.2
	2. Congenital Anomalies	137	237.6
	3-4. Diseases of the Heart - Accidents	14	24.3
	5. Meningitis	10	17.3
	All Causes	714	1,238.5
-4 Years	1. Accidents	62	27.2
	2. Congenital Anomalies	20	8.8
	3. Malignant Neoplasms	11	4.8
	4. Homicide	4	1.8
	5-7. Meningitis - Diseases of the Heart - Certain Conditions Originating in the Perinatal Period	3	1.3
	All Causes	138	60.5
5-14 Years	1. Accidents	125	20.8
	2. Malignant Neoplasms	41	6.8
	3. Diseases of the Heart	8	1.3
	4-6. Congenital Anomalies - Suicide - Homicide	3	0.5
	All Causes	207	34.4
15-24 Years	1. Accidents	540	72.5
	2. Suicide	158	21.2
	3. Homicide	59	7.9
	4. Malignant Neoplasms	49	6.6
	5. Congenital Anomalies	17	2.3
	All Causes	934	125.4
25-34 Years	1. Accidents	390	59.2
	2. Suicide	156	23.7
	3. Malignant Neoplasms	90	13.7
	4. Diseases of the Heart	70	10.6
	5. Homicide	55	8.4
	All Causes	938	142.5

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

WHITE MALES[2]

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
35-49 Years	1. Diseases of the Heart	687	108.3
	2. Malignant Neoplasms	392	61.8
	3. Accidents	290	45.7
	4. Suicide	136	21.4
	5. Chronic Liver Disease and Cirrhosis	110	17.3
	All Causes	2,018	318.1
50-64 Years	1. Diseases of the Heart	3,503	615.1
	2. Malignant Neoplasms	2,214	388.7
	3. Chronic Liver Disease and Cirrhosis	292	51.3
	4. Cerebrovascular Diseases	278	48.8
	5. Accidents	261	45.8
	All Causes	7,835	1,375.7
65 and Over	1. Diseases of the Heart	10,370	3,034.5
	2. Malignant Neoplasms	4,591	1,343.4
	3. Cerebrovascular Diseases	1,807	528.8
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	1,141	333.9
	5. Pneumonia and Influenza	648	189.[illegible]
	All Causes	22,463	6,573.3

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 19[illegible] (Continued)

OTHER THAN WHITE MALES[2]

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
All Ages	1. Diseases of the Heart	1,719	252.4
	2. Malignant Neoplasms	1,211	177.8
	3. Homicide	486	71.4
	4. Cerebrovascular Diseases	338	49.6
	5. Accidents	306	44.9
	All Causes	5,784	849.3
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	206	1,464.7
	2. Congenital Anomalies	30	213.3
	3. Accidents	8	56.9
	4. Diseases of the Heart	5	35.6
	5-8. Meningitis - Pneumonia and Influenza - Nephritis - Cerebrovascular Diseases	3	21.3
	All Causes	319	2,268.2
1-4 Years	1. Accidents	22	39.4
	2. Congenital Anomalies	3	5.4
	3-4. Pneumonia and Influenza - Homicide	2	3.6
	5-8. Diseases of the Heart - Chronic Obstructive Pulmonary Diseases and Allied Conditions - Cerebrovascular Diseases - Nutritional Deficiencies	1	1.8
	All Causes	41	73.4
5-14 Years	1. Accidents	24	16.4
	2. Homicide	9	6.2
	3. Malignant Neoplasms	5	3.4
	4-6. Diseases of the Heart - Pneumonia and Influenza - Hernia	2	1.4
	All Causes	51	35.0
15-24 Years	1. Homicide	116	84.9
	2. Accidents	25	18.3
	3. Suicide	20	14.6
	4. Diseases of the Heart	15	11.0
	5. Malignant Neoplasms	7	5.1
	All Causes	223	163.2
25-34 Years	1. Homicide	178	151.4
	2. Accidents	68	57.8
	3. Diseases of the Heart	37	31.5
	4. Suicide	32	27.2
	5. Chronic Liver Disease and Cirrhosis	18	15.3
	All Causes	488	414.9

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

OTHER THAN WHITE MALES[2]

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
35-49 Years	1. Diseases of the Heart	151	158.2
	2. Homicide	99	103.7
	3. Malignant Neoplasms	96	100.6
	4. Accidents	61	63.9
	5. Chronic Liver Disease and Cirrhosis	55	57.6
	All Causes	659	690.5
50-64 Years	1. Diseases of the Heart	539	717.1
	2. Malignant Neoplasms	457	608.0
	3. Cerebrovascular Diseases	97	129.0
	4. Chronic Liver Disease and Cirrhosis	79	105.1
	5. Homicide	56	74.5
	All Causes	1,544	2,054.1
65 and Over	1. Diseases of the Heart	968	2,401.4
	2. Malignant Neoplasms	630	1,562.9
	3. Cerebrovascular Diseases	200	496.2
	4. Chronic Obstructive Pulmonary Diseases and Allied Conditions	92	228.2
	5. Pneumonia and Influenza	83	205[illegible]
	All Causes	2,458	6,097.9

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

WHITE FEMALES[2]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
All Ages	1. Diseases of the Heart	12,219	304.9
	2. Malignant Neoplasms	6,638	165.6
	3. Cerebrovascular Diseases	3,175	79.2
	4. Accidents	878	21.9
	5. Atherosclerosis	750	18.7
	All Causes	30,298	756.0
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	273	496.0
	2. Congenital Anomalies	121	219.9
	3. Accidents	16	29.1
	4. Diseases of the Heart	10	18.2
	5. Pneumonia and Influenza	7	12.7
	All Causes	541	983.0
1-4 Years	1. Accidents	36	16.7
	2-3. Malignant Neoplasms - Congenital Anomalies	11	5.1
	4. Diseases of the Heart	8	3.7
	5. Homicide	5	2.3
	All Causes	92	42.6
5-14 Years	1. Accidents	52	9.1
	2. Malignant Neoplasms	25	4.4
	3. Congenital Anomalies	8	1.4
	4. Homicide	4	0.7
	5-7. Cerebrovascular Diseases - Pneumonia and Influenza - Chronic Obstructive Pulmonary Diseases and Allied Conditions	3	0.5
	All Causes	130	22.8
15-24 Years	1. Accidents	147	19.9
	2. Malignant Neoplasms	38	5.1
	3. Suicide	29	3.9
	4. Homicide	27	3.7
	5. Congenital Anomalies	12	1.6
	All Causes	328	44.4
25-34 Years	1. Accidents	97	14.7
	2. Malignant Neoplasms	77	11.7
	3. Suicide	53	8.0
	4. Diseases of the Heart	27	4.1
	5. Cerebrovascular Diseases	17	2.6
	All Causes	377	57.1

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

WHITE FEMALES[2]

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
35-49 Years	1. Malignant Neoplasms	512	78.3
	2. Diseases of the Heart	156	23.9
	3. Accidents	108	16.5
	4. Suicide	76	11.6
	5. Cerebrovascular Diseases	58	8.9
	All Causes	1,205	184.3
50-64 Years	1. Malignant Neoplasms	1,907	309.1
	2. Diseases of the Heart	1,291	209.3
	3. Cerebrovascular Diseases	272	44.1
	4. Chronic Liver Disease and Cirrhosis	142	23.0
	5. Chronic Obstructive Pulmonary Diseases and Allied Conditions	132	21.4
	All Causes	4,617	748.4
65 and Over	1. Diseases of the Heart	10,715	2,157.6
	2. Malignant Neoplasms	4,066	818.7
	3. Cerebrovascular Diseases	2,820	567.8
	4. Atherosclerosis	738	148.6
	5. Pneumonia and Influenza	634	127.7
	All Causes	23,007	4,632.7

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

OTHER THAN WHITE FEMALES[2]

AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
All Ages	1. Diseases of the Heart	1,518	203.6
	2. Malignant Neoplasms	890	119.4
	3. Cerebrovascular Diseases	421	56.5
	4. Certain Conditions Originating in the Perinatal Period	161	21.6
	5. Homicide	130	17.4
	All Causes	4,369	586.1
Under 1 Year	1. Certain Conditions Originating in the Perinatal Period	160	1,147.1
	2. Congenital Anomales	27	193.6
	3-4. Diseases of the Heart - Accidents	3	21.5
	5-8. Septicemia - Pneumonia and Influenza - Nephritis - Homicide	2	14.3
	All Causes	262	1,878.4
1-4 Years	1. Accidents	12	21.8
	2. Homicide	9	16.3
	3. Congenital Anomalies	4	7.3
	4. Malignant Neoplasms	2	3.6
	5-9. Septicemia - Nutritional Deficiencies - Anemia - Certain Conditions Originating in the Perinatal Period - Diseases of the Heart	1	1.8
	All Causes	38	69.0
5-14 Years	1. Accidents	11	7.6
	2. Homicide	10	6.9
	3. Malignant Neoplasms	5	3.5
	4-5. Diseases of the Heart - Congential Anomalies	3	2.1
	All Causes	45	31.2
15-24 Years	1. Homicide	26	17.9
	2. Accidents	8	5.5
	3. Diseases of the Heart	6	4.1
	4. Malignant Neoplasms	5	3.4
	5. Suicide	4	2.7
	All Causes	79	54.3
25-34 Years	1. Homicide	39	28.5
	2-3. Malignant Neoplasms - Accidents	26	19.0
	4-6. Diseases of the Heart - Cerebrovascular Diseases - Chronic Liver Disease and Cirrhosis	18	13.2
	All Causes	235	171.8

Table 2.8
Leading Causes of Death and Cause-Specific Rates by Age, Sex, and Race, Michigan Residents, 1981 (Continued)

OTHER THAN WHITE FEMALES[2]			
AGE	RANK AND CAUSE OF DEATH	NUMBER	SPECIFIC RATE
-49 Years	1. Diseases of the Heart	98	88.7
	2. Malignant Neoplasms	86	77.9
	3. Chronic Liver Disease and Cirrhosis	31	28.1
	4. Cerebrovascular Diseases	29	26.3
	5. Homicide	23	20.8
	All Causes	377	341.4
-64 Years	1. Malignant Neoplasms	343	401.4
	2. Diseases of the Heart	332	388.5
	3. Cerebrovascular Diseases	91	106.5
	4. Chronic Liver Disease and Cirrhosis	44	51.5
	5. Diabetes Mellitus	37	43.3
	All Causes	1,039	1,215.9
and Over	1. Diseases of the Heart	1,057	1,953.6
	2. Malignant Neoplasms	423	781.8
	3. Cerebrovascular Diseases	280	517.5
	4. Diabetes Mellitus	74	136.8
	5. Pneumonia and Influenza	56	103.5
	All Causes	2,294	4,240.[illegible]

DISEASES OF THE HEART

The leading cause of death, heart disease, caused the deaths of 30,172 Michigan residents in 1981. This is more than the number of deaths from the next five largest categories combined. There were 382 more deaths from heart disease in 1981 than in 1980. The crude rate of 325.5 deaths per 100,000 population from this cause in 1981 is 1.2 percent above the rate of 321.6 in 1980.

The median age of persons who died from heart disease was 75 years, compared to a median of 72 years for deaths from all causes. Of the 30,172 deaths due to diseases of the heart, 54.4 percent were to males. The median age at death for males was 71 years compared to 80 years for females. The median age of 72 years for white males exceeded that for other than white males by 5 years. The median age at death for white females was 80 years, 8 years above that for other than white females (Table 2.9).

Table 2.10 presents death rates for diseases of the heart by age, race and sex. Note that the death rate associated with this cause rises markedly with advancing age. Heart disease was the underlying cause of death for 45 persons below 5 years of age or about 2.1 percent of all deaths in this age group. In contrast, 50.5 percent of all deaths in the age group 85 and over were attributed to this cause in 1981. The heart disease death rate was 8,113.6 among persons 85 years of age or older.

Examination of Table 2.10 reveals that the heart disease death rate for males was substantially higher than that for females (363.7 compared to 289.2 per 100,000 population). The relationship between rates for males and females is graphically displayed in Figure 2.6. The age-specific heart disease death rates for males and females were the same for the age group 1-14. Rates for males were above those of females in all other age groups. The greatest relative differentials occurred from age 35 through 64 with rates for males ranging from 2.6 to 3.4 times the corresponding rates for females. The gap between rates for males and females became progressively smaller after age 44. Among persons 85 years or over the rate of 9,215.4 for males was 21 percent above that for females (7,618.7). The age-adjusted death rate for males was 2.0 times that for females.

A comparison of 1981 heart disease death rates for males by race is graphically presented in Figure 2.7. Rates for other than white males were higher than those for white males between ages 1 and 64 and lower than rates for white males in all age intervals beyond age 64. The rate for white males across all ages was 383.2 compared to 253.7 for other than white males. This differential stems from the

Table 2.9
Deaths Due to Diseases of the Heart by Age, Race, and Sex[1], Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	32	19	13	24	14	10	8	5	3	-	-	-
1-4	13	4	9	11	3	8	2	1	1	-	-	-
5-9	5	3	2	3	2	1	2	1	1	-	-	-
10-14	10	7	3	7	6	1	3	1	2	-	-	-
15-19	10	8	2	5	3	2	5	5	-	-	-	-
20-24	37	23	14	21	13	8	16	10	6	-	-	-
25-29	47	35	12	27	19	8	20	16	4	-	-	-
30-34	106	72	34	70	51	19	35	21	14	1	-	1
35-39	195	143	52	148	120	28	47	23	24	-	-	-
40-44	308	243	65	235	198	37	73	45	28	-	-	-
45-49	591	454	137	460	369	91	129	83	46	2	2	-
50-54	1099	831	268	900	704	196	198	126	72	1	1	-
55-59	1920	1401	519	1614	1201	413	298	193	105	8	7	1
60-64	2659	1821	838	2280	1598	682	375	220	155	4	3	1
65-69	3492	2290	1201	3045	2037	1007	440	246	194	7	7	-
70-74	3894	2343	1551	3482	2118	1364	410	223	187	2	2	-
75-79	4506	2363	2142	4087	2160	1926	417	202	215	2	1	1
80-84	4365	1940	2424	4006	1777	2229	356	160	195	3	3	-
85-89	3997	1562	2435	3747	1467	2280	244	91	153	6	4	2
90+	2882	857	2025	2720	811	1909	159	46	113	3	-	3
Not Stated	4	4	-	3	3	-	1	1	-	-	-	-
All Ages	30172	16423	13746	26895	14674	12219	3238	1719	1518	39	30	9
Median Age At Last Birthday	75	71	80	76	72	80	69	67	72	68	66	*

[1] The deaths of 2 white and 1 other than white persons with sex not stated are included only in the total columns.

Table 2.10
Heart Disease Death Rates by Age, Race, and Sex[1],
Michigan Residents, 1981

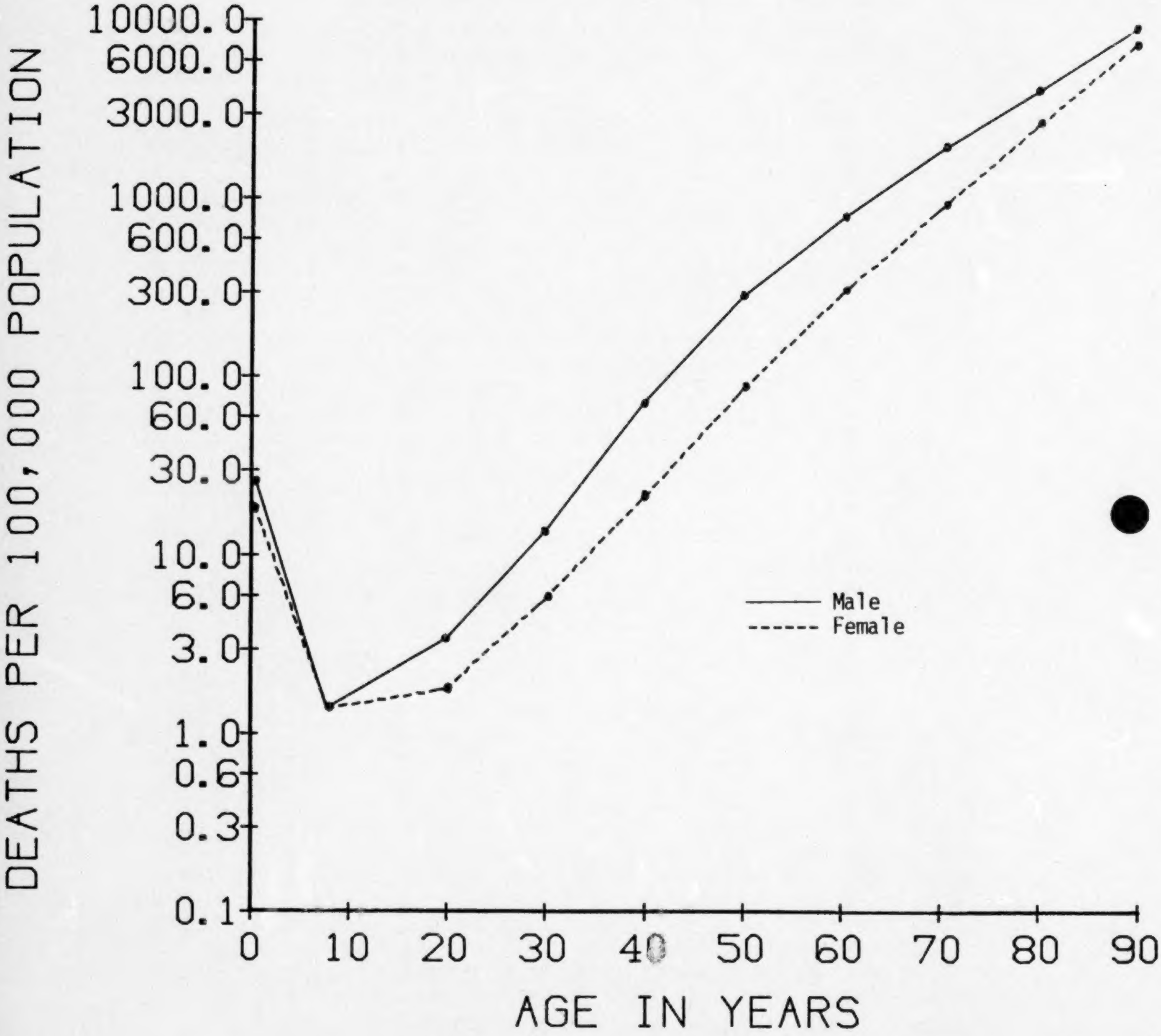
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	325.5	363.7	289.2	343.3	383.2	305.1	227.7	253.7	203.9
Under 1 Year	22.7	26.5	18.8	21.3	24.3	18.2	28.6	35.6	*
1-14 Years	1.4	1.4	1.4	1.3	1.3	1.3	1.7	*	*
15-24 Years	2.7	3.5	1.8	1.8	2.1	1.4	7.4	11.0	4.1
25-34 Years	9.7	13.8	5.8	7.4	10.6	4.2	21.6	31.5	13.2
35-44 Years	47.6	74.5	21.7	42.1	70.8	14.1	81.5	98.9	66.3
45-54 Years	185.6	290.6	86.5	171.9	277.3	71.0	276.9	385.6	184.4
55-64 Years	524.3	777.8	295.5	505.0	764.6	270.4	671.4	880.1	486.4
65-74 Years	1304.8	1859.4	868.5	1295.2	1875.9	839.2	1382.8	1725.8	1109.6
75-84 Years	3147.4	4041.0	2604.4	3168.7	4118.5	2600.0	2940.2	3355.2	2649.9
85 Years and Over	8113.6	9215.4	7618.7	8261.7	9460.5	7727.9	6309.2	6448.6	6239.8
Age-Adjusted Rate[2]	213.1	295.7	146.8	209.0	294.6	140.4	238.6	297.0	190.3

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

FIGURE 2.6 AGE-SPECIFIC HEART DISEASE DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



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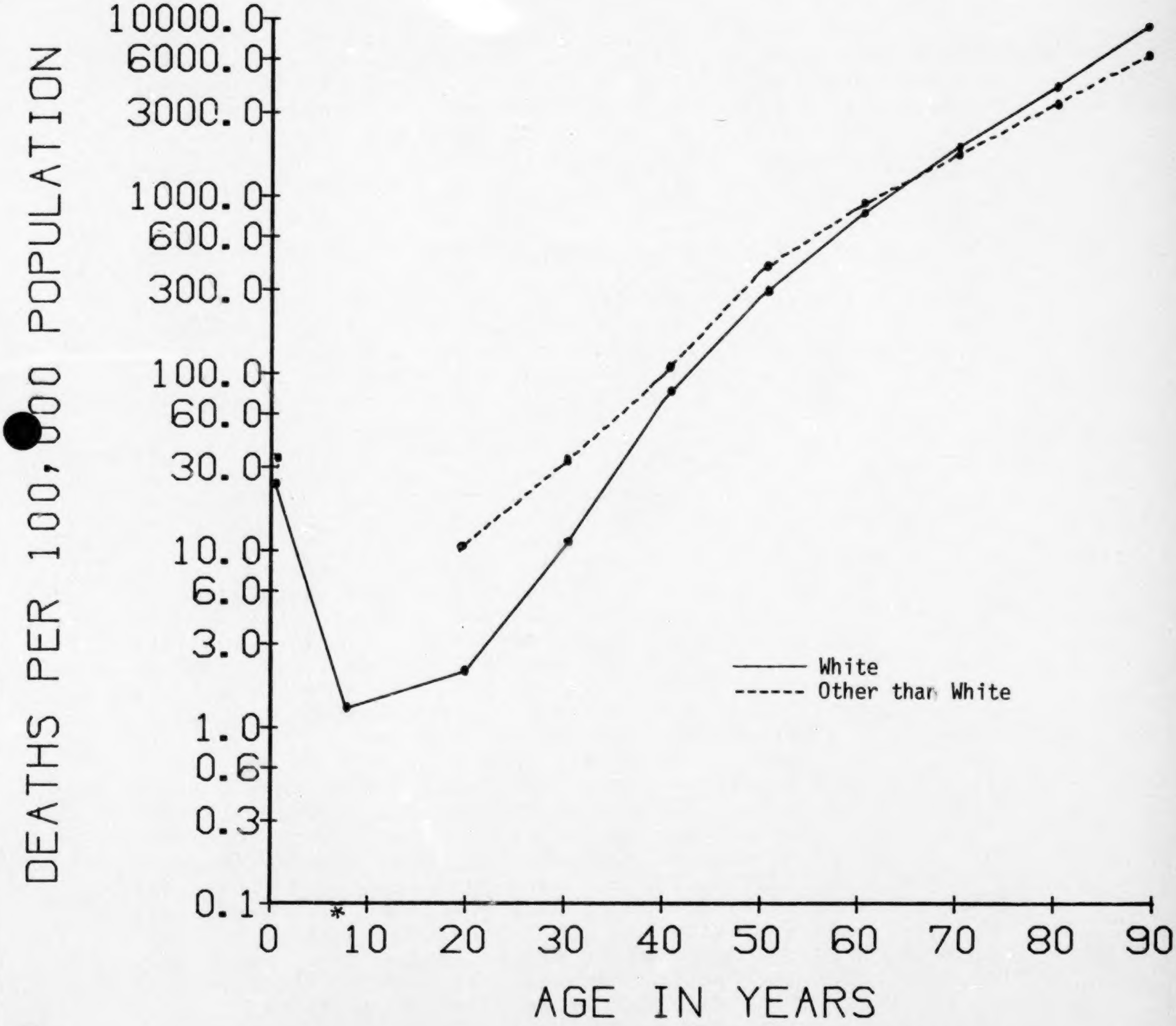
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.7 AGE-SPECIFIC HEART DISEASE DEATH RATES[1] BY RACE, MICHIGAN RESIDENT MALES, 1981



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[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

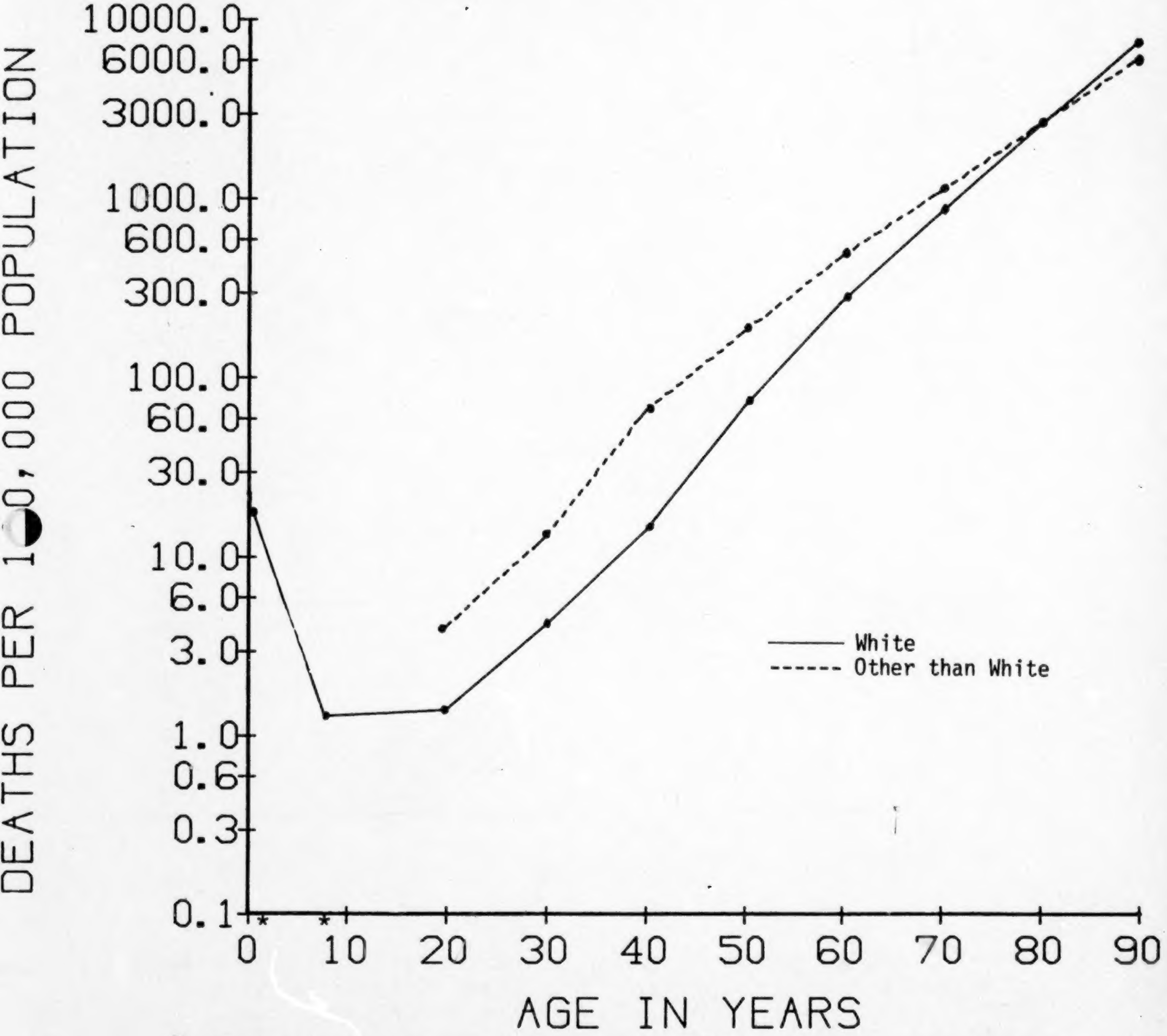
fact that a greater proportion of the white male population was in the older age groups where heart disease death rates were particularly high. The age-adjusted heart disease death rate for white males was 294.6 in 1981, 0.8 percent below the rate of 297.0 for other than white males.

Heart disease death rates for white and other than white females are displayed in Figure 2.8. Rates for other than white females were greater than those for white females between ages 15 and 84. After age 44 the relative differentials steadily decreased with advancing age. Beyond age 84 the rate for white females exceeded that for other than white females by 24 percent. Although the rate for white females of all ages (305.1) was substantially above the comparable rate for other than white females (203.9), this relationship is reversed when the differing age distributions of the two populations are considered. The age-adjusted rate for other than white females was 190.3 while that for white females was 140.4.

In 1900 the crude heart disease death rate in Michigan was 117.1, the lowest rate of this century. Heart disease death rates rose through the time period 1900-1950 and have remained relatively stable over the last thirty-one years. The highest rate observed during the century was 343.1 in 1965. The rate of 325.5 for 1981 was 5 percent below the peak rate observed in 1965. The rate for Michigan was consistently close to the national rate until 1947. Since that time the crude rate for Michigan has been below that of the nation. In 1981, the rate for the nation was an estimated 330.6, 1.6 percent above the rate of death due to heart disease for Michigan (Figure 2.9).

Age-adjusted death rates for diseases of the heart since 1970 are presented in Table 2.11. These data indicate a downward trend in heart disease death rates for the population as a whole and for each race-sex subgroup individually. Between 1970 and 1972 the rate for Michigan remained constant. Since 1972 the rate has declined each year, with the exception of 1976. The age-adjusted death rate for the nation declined each year between 1970 and 1979. The 1980 provisional rate for the United States exceeded by 0.9 percent the 1979 rate. The age-adjusted rate for Michigan declined by 18 percent between 1970 and 1981 whereas the age-adjusted rate for the nation declined by 19 percent between 1970 and 1980 (see Technical Notes). The age-adjusted rate for Michigan has been above that for the nation consistently since 1970. In 1980 Michigan's rate was 4.7 percent above the provisional national rate. Age-adjusted rates for other than white females have been well above those for white females in both Michigan and the United States. In Michigan age-adjusted rates for other than white males have tended to be slightly below those for white males, while this relationship is reversed for the

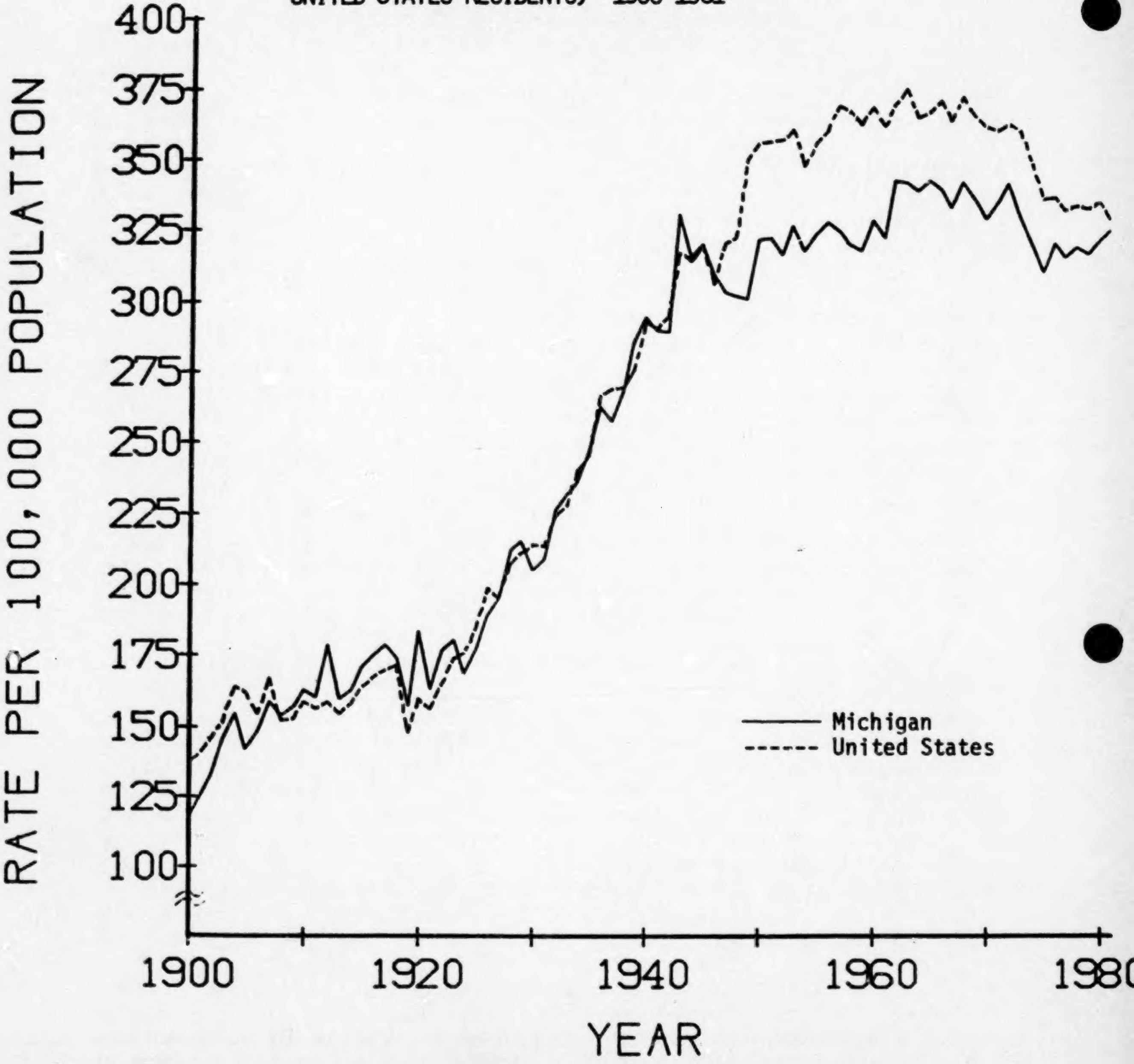
FIGURE 2.8 AGE-SPECIFIC HEART DISEASE DEATH RATES[1] BY RACE,
MICHIGAN RESIDENT FEMALES, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.9 HEART DISEASE DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS,[1] 1900-1981[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. United States rates for 1980 and 1981 are provisional.

[2] Heart Disease death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

Table 2.11
Age-Adjusted Heart Disease Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	260.4	352.2	181.2	257.0	352.5	175.1	280.6	336.6	230.2
	1971	259.7	358.7	175.5	256.0	359.1	168.9	280.5	338.2	228.3
	1972	260.5	355.2	180.3	257.0	354.3	174.9	281.1	352.2	218.4
	1973	247.7	339.2	170.8	244.1	338.2	165.2	269.3	335.9	210.8
	1974	235.6	321.7	163.7	233.0	322.6	158.4	249.0	304.5	200.8
	1975	226.2	312.2	154.5	225.2	314.5	151.1	226.0	283.2	176.3
	1976	228.0	316.6	155.4	226.3	317.9	151.6	235.6	297.9	182.4
	1977	221.5	308.3	150.7	218.8	309.1	145.4	235.6	292.4	187.1
	1978	219.0	302.4	151.2	215.7	302.2	145.7	239.6	296.5	191.9
	1979	215.4	298.5	148.5	212.1	297.6	143.5	234.2	297.9	181.5
	1980	214.9	295.5	150.6	210.9	293.7	145.0	239.9	303.6	188.4
	1981	213.1	295.7	146.8	209.0	294.6	140.4	238.6	297.0	190.3
U.S.	1970	253.6	348.5	175.2	249.1	347.6	167.8	288.9	350.8	236.6
	1971	252.0	344.6	175.1	247.4	343.0	168.2	297.3	363.3	242.3
	1972	249.3	344.5	171.6	244.9	343.3	164.7	283.1	349.3	228.5
	1973	244.4	339.3	167.4	239.9	338.1	160.3	279.8	344.7	225.8
	1974	232.7	323.6	159.2	228.8	322.8	152.9	262.8	325.8	210.8
	1975	220.5	308.3	149.7	217.2	308.0	144.2	245.2	307.0	194.6
	1976	216.7	303.3	147.1	213.5	303.0	141.7	241.1	302.8	190.3
	1977	210.4	294.7	142.9	206.8	294.0	137.2	237.9	297.8	188.7
	1978	207.6	289.8	141.8	204.0	288.8	136.5	234.7	295.8	184.7
	1979	203.5	282.5	140.3	199.8	281.2	134.8	232.8	291.9	184.5
	1980	205.3[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Provisional.

nation.

The most prevalent type of heart disease death is acute myocardial infarction (12,274 deaths in 1981), commonly referred to as a "coronary" (Table 2.12). The second most frequent is old myocardial infarction and other forms of chronic ischemic heart disease. In 1981 there were 9,942 deaths attributed to this cause. Together, these causes accounted for 73.6 percent of all Michigan resident deaths from heart disease. Of the remaining 7,956 heart disease deaths, 74.1 percent were attributed to all other and ill-defined forms of heart disease (4,751 deaths) and heart failure (1,143 deaths).

The probability of eventually dying from heart disease, based on Michigan resident death data from 1979, 1980, and 1981 and census population data for 1980, is 0.422 for males and 0.439 for females at birth. The chance associated with dying from heart disease increases steadily for both sexes with advancing age as certain competing causes of death become less likely. By age 85, the observed probability is 0.483 for males and 0.517 for females. At all ages the probability of death eventually being caused by heart disease is greater for females. These differentials by sex are smallest between ages 25 and 50. The higher probability for females reflects smaller chances of death due to some cause other than heart disease (Figure 2.10).

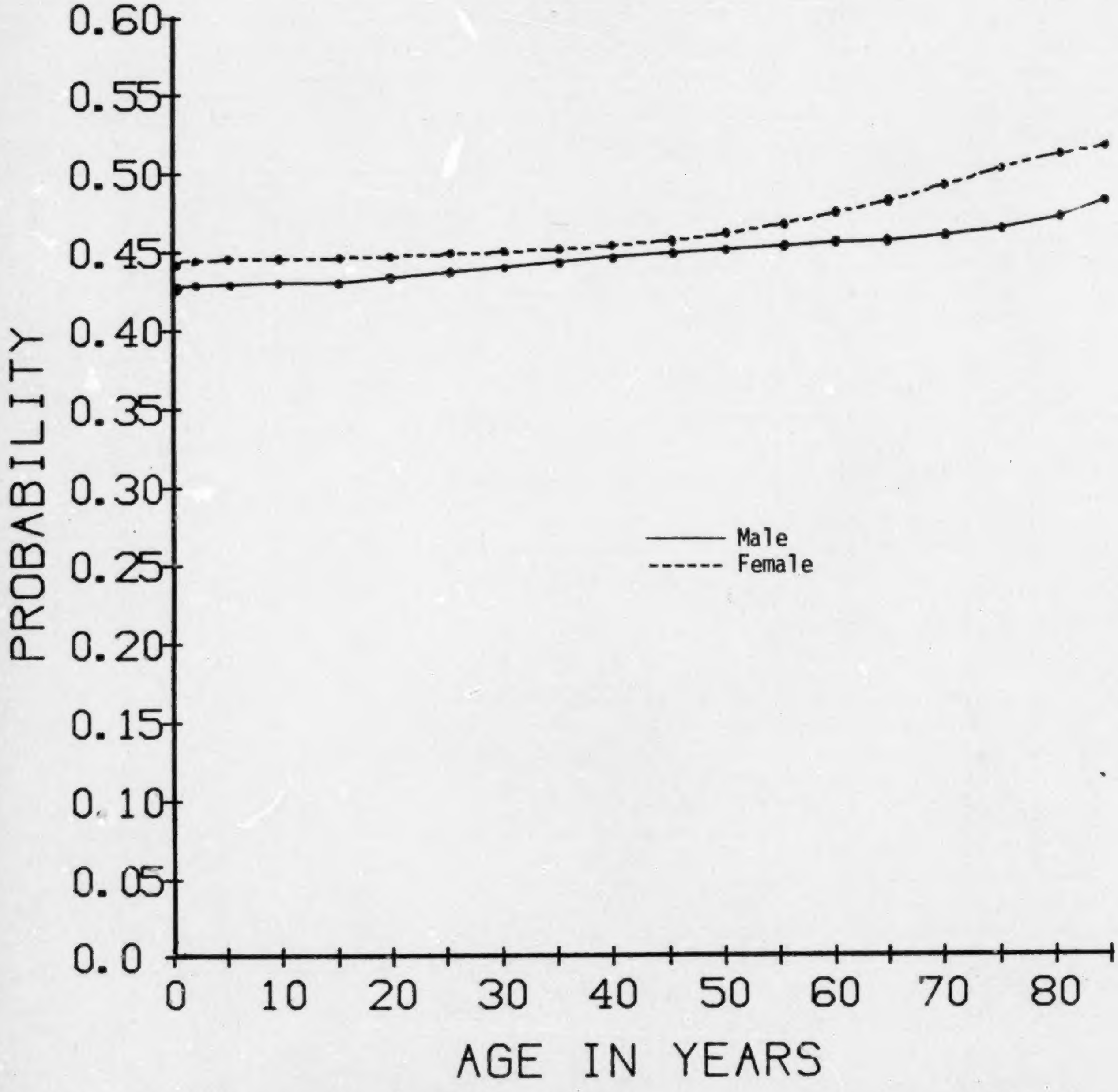
An apparent inconsistency can be noted by review of Figure 2.6 and Figure 2.10. The heart disease mortality rate for males is higher than that for females over nearly all ages, yet the chance of eventual death due to heart disease is slightly greater for females at all ages. This paradox is explained by a comparison of these two measures. The cause-specific mortality rate measures the proportion of a population that died from the particular cause over a certain period of time. The probability estimate takes into account the present age and cause-specific mortality rates and the life expectancy of the population. A greater proportion of all females now alive are expected to live into the older age intervals where they will be subject to the high heart disease mortality rates characteristic of those age groups. The effect of the longer female life span outweighs the effect of the higher mortality rate for males from heart disease.

Table 2.12
Deaths Due to Diseases of the Heart by Specific Cause, Michigan Residents, 1981

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
136	Acute Myocardial Infarction	12,274	40.7
139	Old Myocardial Infarction and Other Forms of Chronic . . Ischemic Heart Disease	9,942	33.0
148	All Other and Ill-Defined Forms of Heart Disease	4,751	15.7
146	Heart Failure	1,143	3.8
133	Hypertensive Heart Disease	695	2.3
140	Diseases of Pulmonary Circulation	456	1.5
144	Aortic Valve Disorders	162	0.5
131	All Other Chronic Rheumatic Heart Disease	125	0.4
135	Hypertensive Heart and Renal Disease	110	0.4
147	Myocarditis, Unspecified and Myocardial Degeneration . .	107	0.4
128	Diseases of Mitral Valve	90	0.3
137	Other Acute and Subacute Forms of Ischemic Heart Disease	73	0.2
145	All Other Diseases of Endocardium	55	0.2
143	Mitral Valve Disorders	53	0.2
130	Diseases of Mitral and Aortic Valves	40	0.1
141	Acute and Subacute Endocarditis	33	0.1
142	Acute Pericarditis, Acute Myocarditis, and Other . . . . Diseases of Pericardium	23	0.1
138	Angina Pectoris	20	0.1
129	Diseases of Aortic Valve	17	0.1
127	Acute Rheumatic Fever	3	0.0
	Total	30,172	100.0

[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.10 PROBABILITY OF EVENTUALLY DYING FROM HEART DISEASE BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

CANCER

Of 75,818 Michigan resident deaths in 1981, 16,142 were attributed to cancer. Although not the leading cause of death in Michigan or the United States, cancer affects all the human body's major systems and persons of all ages. The frequency of death due to cancer was 53.5 percent of the number of deaths due to heart disease across all ages, but the number of cancer deaths below age 55 was greater than the number of deaths due to heart disease below age 55. The median age at death for cancer was 68 years, well below the median age of 75 years for heart disease deaths (Table 2.13).

Of the 16,142 cancer deaths in 1981 occurring to Michigan residents, 53.3 percent were to males. The median age at death was 68 years for white males and 69 years for white females. The median ages at death for other than white persons who died of cancer were somewhat lower, 65 years for males and 63 years for females.

Cancer death rates by age, race and sex are presented in Table 2.14. The cancer death rate across all ages in 1981 was higher for males (190.6) than for females (158.5). The cancer death rates displayed in Figure 2.11 show a strong increase in mortality with advancing age. Mortality rates for males were higher than those for females below age 35. In the age groups 35-44 years and 45-54 years the rates for females were higher (18 percent and 1.3 percent, respectively) than those for males. After age 54 the rates for males were greater than those for females. Between ages 55 and 84 the relative differential increased steadily, from 38 percent in the 55-64 year age group to 91 percent in the age group 75-84 years. The age-adjusted cancer death rate for males was 42 percent above that for females.

Cancer death rates for white and other than white males recorded in Table 2.14 are graphically displayed in Figure 2.12. Rates for white males were higher below age 35. Rates for other than white males exceeded those for white males at all ages beyond 34 years. The largest relative differential occurred in the age group 45-54 years, where the rate for other than white males exceeded by 83 percent the rate for white males. Although the crude death rate for other than white males was below the comparable rate for white males, the age-adjusted rate for other than white males was 35 percent higher than the age-adjusted rate for white males.

Cancer death rates for white females were above those for other than white females only below age 25 and in the age group 75-84 years (Figure 2.13). The crude rate for white females was 39 percent higher than the crude rate for other than white females. The age-adjusted rate for other

Table 2.13
Deaths Due to Cancer by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	4	2	2	4	2	2	-	-	-	-	-	-
1-4	24	11	13	22	11	11	2	-	2	-	-	-
5-9	36	22	14	30	18	12	6	4	2	-	-	-
10-14	40	24	16	36	23	13	4	1	3	-	-	-
15-19	48	27	21	45	25	20	3	2	1	-	-	-
20-24	51	29	22	42	24	18	9	5	4	-	-	-
25-29	75	41	34	59	34	25	16	7	9	-	-	-
30-34	135	66	69	108	56	52	26	9	17	1	1	-
35-39	202	80	122	173	70	103	29	10	19	-	-	-
40-44	307	148	159	251	117	134	56	31	25	-	-	-
45-49	578	261	317	480	205	275	97	55	42	1	1	-
50-54	1095	546	549	901	436	465	194	110	84	-	-	-
55-59	1693	912	781	1408	750	658	284	161	123	1	1	-
60-64	2136	1214	922	1812	1028	784	322	186	136	2	-	2
65-69	2400	1380	1020	2094	1182	912	305	198	107	1	-	1
70-74	2359	1296	1063	2069	1129	940	287	165	122	3	2	1
75-79	2140	1168	972	1930	1038	892	207	128	79	3	2	1
80-84	1466	770	696	1328	687	641	137	82	55	1	1	-
85-89	934	447	487	869	416	453	65	31	34	-	-	-
90+	419	165	254	367	139	228	52	26	26	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	16142	8609	7533	14028	7390	6638	2101	1211	890	13	8	5
Median Age At Last Birthday	68	68	68	68	68	69	65	65	63	*	*	*

Table 2.14
Cancer Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

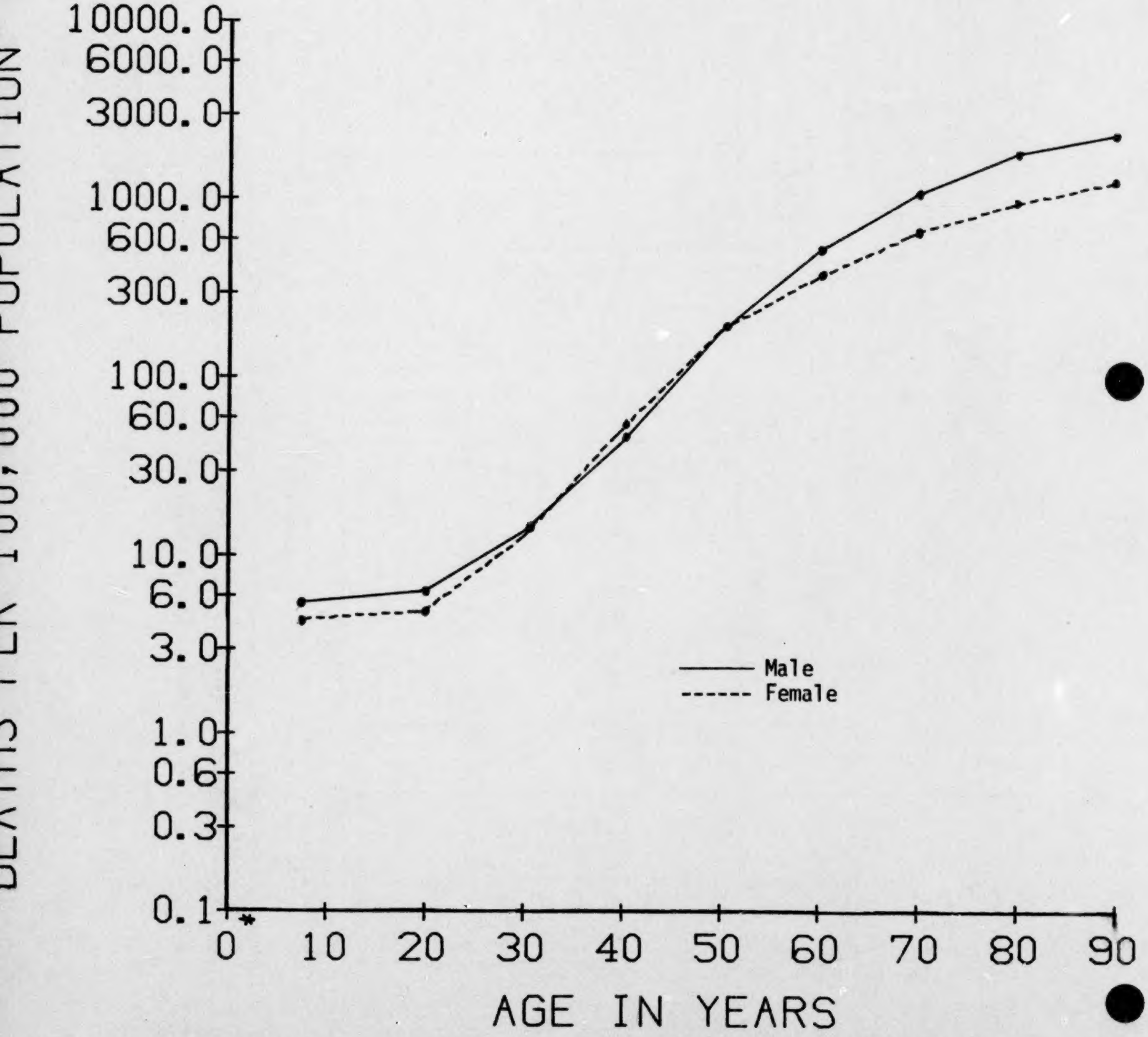
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	174.1	190.6	158.5	179.0	192.9	165.7	147.3	177.8	119.4
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	5.0	5.5	4.4	5.4	6.3	4.6	3.0	2.5	3.5
15-24 Years	5.6	6.4	4.9	5.9	6.6	5.1	4.3	5.1	3.4
25-34 Years	13.3	13.8	12.9	12.7	13.8	11.7	16.5	13.6	19.0
35-44 Years	48.1	44.0	52.1	46.6	41.6	51.5	57.7	59.6	56.1
45-54 Years	183.7	182.5	184.9	174.5	165.6	182.9	245.7	303.0	196.9
55-64 Years	438.4	513.2	370.9	417.2	484.9	355.9	601.0	732.3	484.6
65-74 Years	840.7	1073.8	657.4	826.1	1042.5	656.2	959.7	1327.2	666.9
75-84 Years	1279.4	1819.2	951.4	1276.4	1805.4	959.7	1308.4	1941.0	866.1
85 Years and Over	1594.9	2327.6	1265.8	1576.6	2297.9	1255.4	1818.2	2663.6	1397.0
Age-Adjusted Rate[2]	135.0	163.3	114.6	131.3	157.1	113.0	163.4	211.5	125.5

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

FIGURE 2.11 AGE-SPECIFIC CANCER DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



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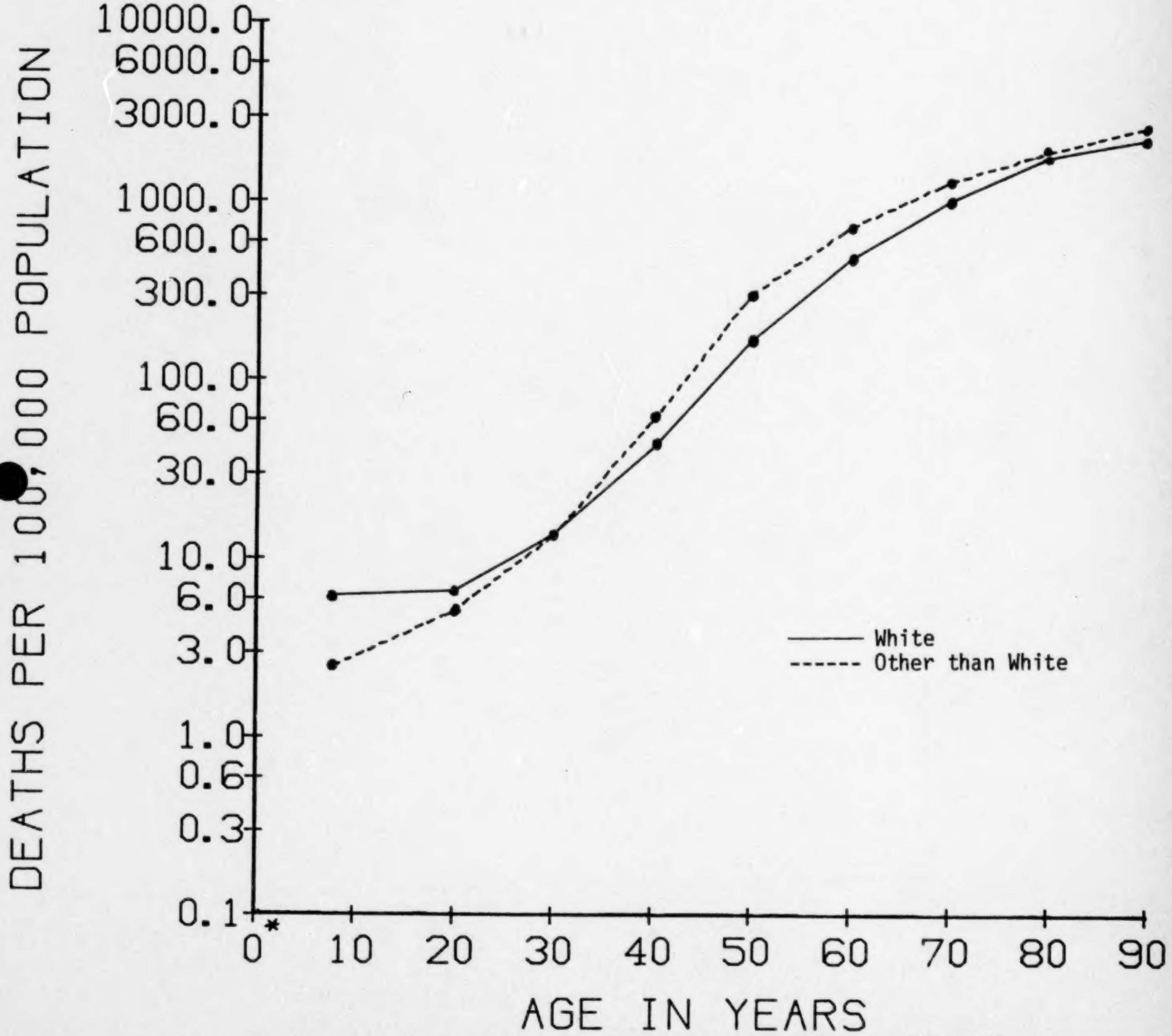
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.12 AGE-SPECIFIC CANCER DEATH RATES[1] BY RACE, MICHIGAN RESIDENT MALES, 1981



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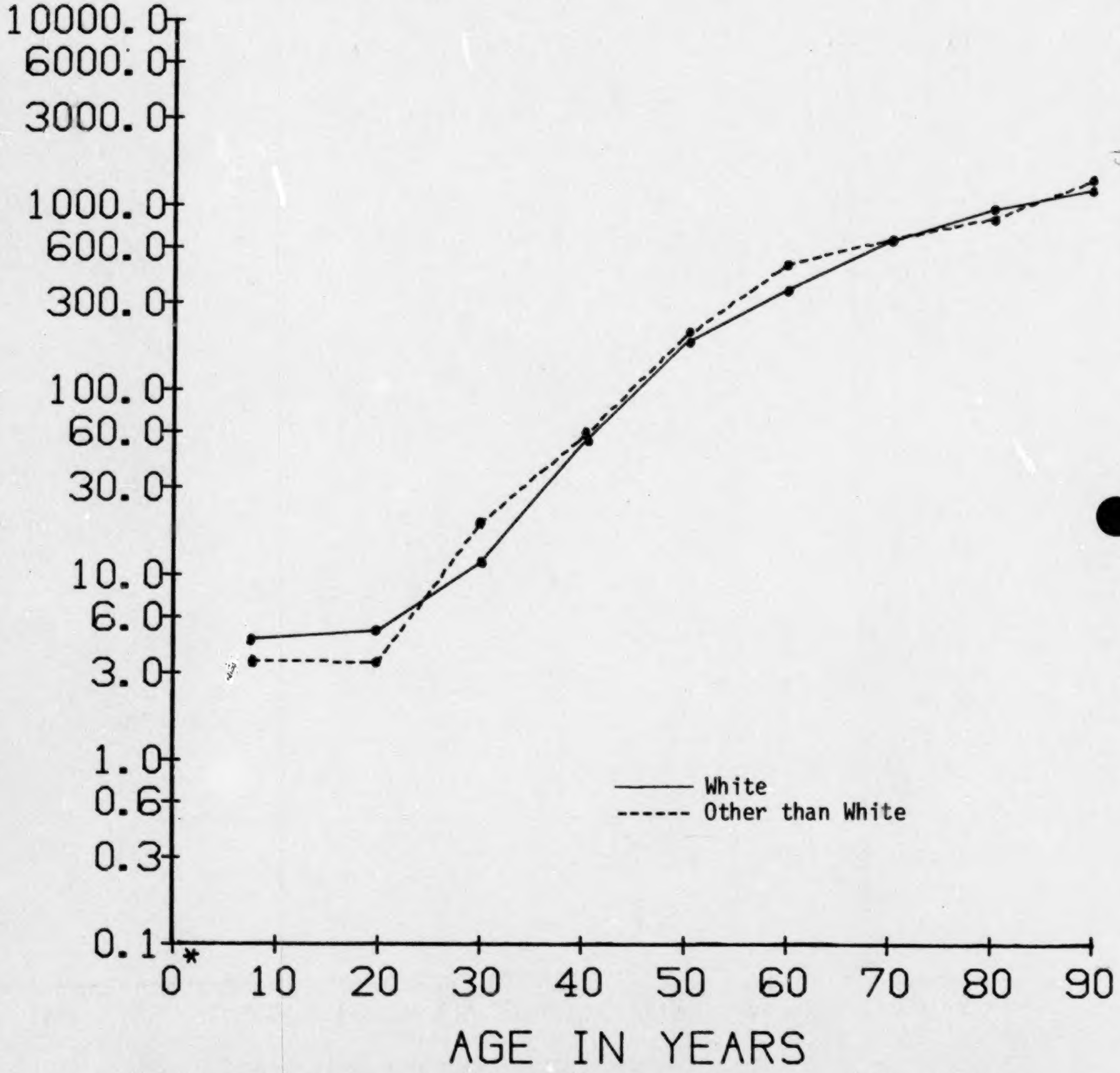
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.13 AGE-SPECIFIC CANCER DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1981



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[1]Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

than white females, however, was 11 percent greater than that for white females.

Among the major cause of death categories, cancer death rates have increased most persistently during the 20th century (Figure 2.14). The rate increased for the seventh consecutive year in 1981 to 174.1, the highest observed in this century. The 1981 rate surpassed by 1.9 percent the previous high rate of 170.9 in 1980. The lowest observed rate for Michigan was 59.3 in 1902. Michigan's cancer death rate was below the national rate from 1900 through 1915. During the period 1916 through 1947 Michigan's rate was generally close to the national rate. Since 1948, the state rate has been consistently below the national cancer death rate. The national cancer death rate in 1981 was an estimated 184.3. This is 6 percent above the state rate.

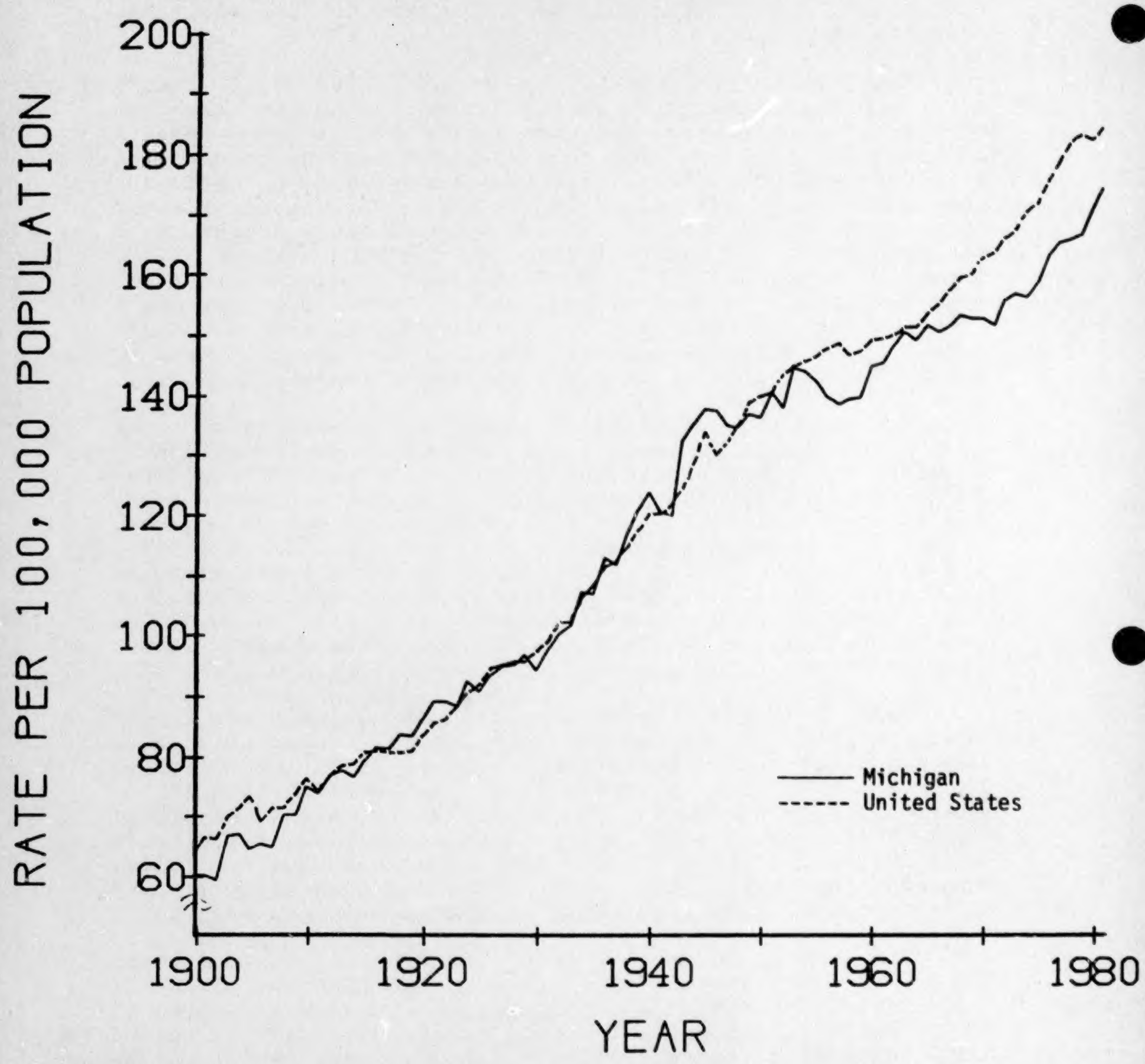
Age-adjusted cancer death rates for the years since 1970 presented in Table 2.15 show a much closer relationship between Michigan and United States mortality patterns than that indicated by crude mortality rates. Michigan's 1970 age-adjusted rate for the total population was 3.7 percent higher than the comparable U.S. rate. Since 1970, Michigan's age-adjusted cancer death rate has remained quite stable while the U.S. rate increased moderately. Michigan's 1981 age-adjusted cancer death rate was 135.0. The provisional figure for 1980 was 134.2 for the United States (see Technical Notes).

Table 2.15 contains a comparison of age-adjusted cancer death rates for white males, white females, other than white males and other than white females. The rates for the other than white groups were consistently higher than those for their white counterparts. Rates for white males and other than white males have increased nationally while the rates in Michigan for these groups have remained quite stable. Age-adjusted rates for white and other than white females were essentially stable both in Michigan and the nation.

The numbers of deaths from cancer for 50 different sites are presented in Table 2.16. Malignant neoplasms of the trachea, bronchus, and lung were the underlying cause of 4,026 deaths, 24.9 percent of all cancer deaths. The second most frequent category of cancer mortality was cancer of the female breast (1,446). Cancer of other and unspecified parts of the colon was the third leading cause of cancer mortality (1,408 deaths). The total number of deaths attributed to colon cancer was 1,629. Malignant neoplasms of the prostate and the pancreas caused 862 and 788 deaths, respectively. There were 27 categories which had at least 100 deaths in 1981.

Based upon 1979 through 1981 death data, the probability of death due to cancer is 0.210 for males and

FIGURE 2.14 CANCER DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS,[1] 1900-1981[2]



[1] National rates are from Death Registration States for 1900-1932 and the United States f 1933-1981. United States rates for 1980 and 1981 are provisional.

[2] Cancer death rates since 1900 are suitable for general comparison over time but detaile study (such as time series) requires special consideration. See Technical Notes.

Table 2.15
Age-Adjusted Cancer Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	134.7	164.7	110.1	131.9	160.2	109.1	159.4	206.6	117.1
	1971	131.6	159.0	109.7	128.7	154.9	108.0	157.4	195.8	123.2
	1972	133.8	163.2	111.0	130.8	159.5	108.7	159.4	194.1	129.6
	1973	133.8	163.1	110.7	130.9	159.0	109.0	157.8	199.0	122.7
	1974	131.9	160.6	109.6	129.2	156.5	108.4	153.1	194.9	117.5
	1975	131.7	161.6	108.9	128.5	155.8	108.0	158.4	210.3	114.7
	1976	134.1	165.5	110.2	131.1	160.2	109.3	158.7	209.8	116.1
	1977	134.5	168.8	108.5	131.0	163.1	106.9	163.5	214.9	121.5
	1978	133.7	166.7	109.2	130.7	161.3	108.3	156.8	209.8	114.1
	1979	131.8	165.3	107.0	128.8	160.7	105.4	154.8	200.7	118.0
	1980	134.4	167.8	109.7	131.3	162.7	108.5	157.5	207.6	117.7
	1981	135.0	163.3	114.6	131.3	157.1	113.0	163.4	211.5	125.5
U.S.	1970	129.9	157.4	108.8	127.8	154.3	107.6	148.3	185.3	117.6
	1971	130.7	158.5	109.4	127.7	154.6	107.2	160.8	198.7	129.7
	1972	130.7	159.8	108.8	128.3	156.4	107.4	152.2	191.2	120.4
	1973	130.7	160.1	108.7	127.7	156.2	106.8	156.4	195.9	124.3
	1974	131.8	162.3	109.2	129.0	158.3	107.6	156.6	199.0	122.4
	1975	130.9	161.4	108.3	128.1	157.2	106.9	155.0	199.7	118.9
	1976	132.3	163.4	109.4	129.5	159.1	108.2	156.3	202.3	119.3
	1977	133.0	164.5	110.0	130.0	160.0	108.3	159.3	205.4	122.4
	1978	133.8	165.8	110.5	130.8	161.2	109.0	159.1	205.8	121.8
	1979	133.2	165.6	109.6	130.2	161.1	107.9	159.0	205.0	122.4
	1980	134.2[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Provisional.

Table 2.15
Deaths Due to Malignant Neoplasms by Site Affected, Michigan Residents, 1981

282 LIST^1 NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
57	Malignant Neoplasms of Trachea, Bronchus, and Lung	4,026	24.9
63	Malignant Neoplasms of Female Breast	1,445	9.0
48	Malignant Neoplasms of Other and Unspecified Colon	1,408	8.7
78	Malignant Neoplasms of All Other and Unspecified Sites	1,207	7.5
69	Malignant Neoplasms of Prostate	862	5.3
54	Malignant Neoplasms of Pancreas	788	4.9
42	Malignant Neoplasms of Stomach	535	3.3
75	Malignant Neoplasms of Brain	429	2.7
67	Malignant Neoplasms of Ovary and Other Uterine Adnexa	406	2.5
72	Malignant Neoplasms of Bladder	381	2.4
41	Malignant Neoplasms of Esophagus	352	2.2
49	Malignant Neoplasms of Rectum, Rectosigmoid Junction, and Anus	333	2.1
81	Other Malignant Neoplasms of Lymphoid and Histiocytic Tissue	329	2.0
73	Malignant Neoplasms of Kidney and Other and Unspecified Urinary Organs	308	1.9
82	Multiple Myeloma and Immunoproliferative Neoplasms	288	1.8
84	Myeloid Leukemia	284	1.8
66	Malignant Neoplasms of Other Parts of Uterus	240	1.5
79	Lymphosarcoma and Reticulosarcoma	202	1.3
65	Malignant Neoplasms of Cervix Uteri	191	1.2
53	Malignant Neoplasms of Gallbladder and Extrahepatic Bile Ducts	183	1.1
61	Melanoma of Skin	172	1.1
86	Other and Unspecified Leukemia	157	1.0
56	Malignant Neoplasms of Larynx	156	1.0
83	Lymphoid Leukemia	145	0.9
52	Malignant Neoplasms of Liver not Specified as Primary or Secondary	128	0.8
39	Malignant Neoplasms of Pharynx	124	0.8
60	Malignant Neoplasms of Connective and Other Soft Tissue	100	0.6
47	Malignant Neoplasms of Cecum, Appendix, and Ascending Colon	96	0.6
55	Malignant Neoplasms of Retroperitoneum, Peritoneum, and Other and Ill-Defined Sites within the Digestive Organs and Peritoneum	96	0.6
46	Malignant Neoplasms of Sigmoid Colon	89	0.6
80	Hodgkin's Disease	88	0.5
40	Malignant Neoplasms of Other and Ill-Defined Sites within Lip, Oral Cavity, and Pharynx	82	0.5
50	Malignant Neoplasms of Liver, Primary	77	0.5
38	Malignant Neoplasms of Tongue	56	0.3

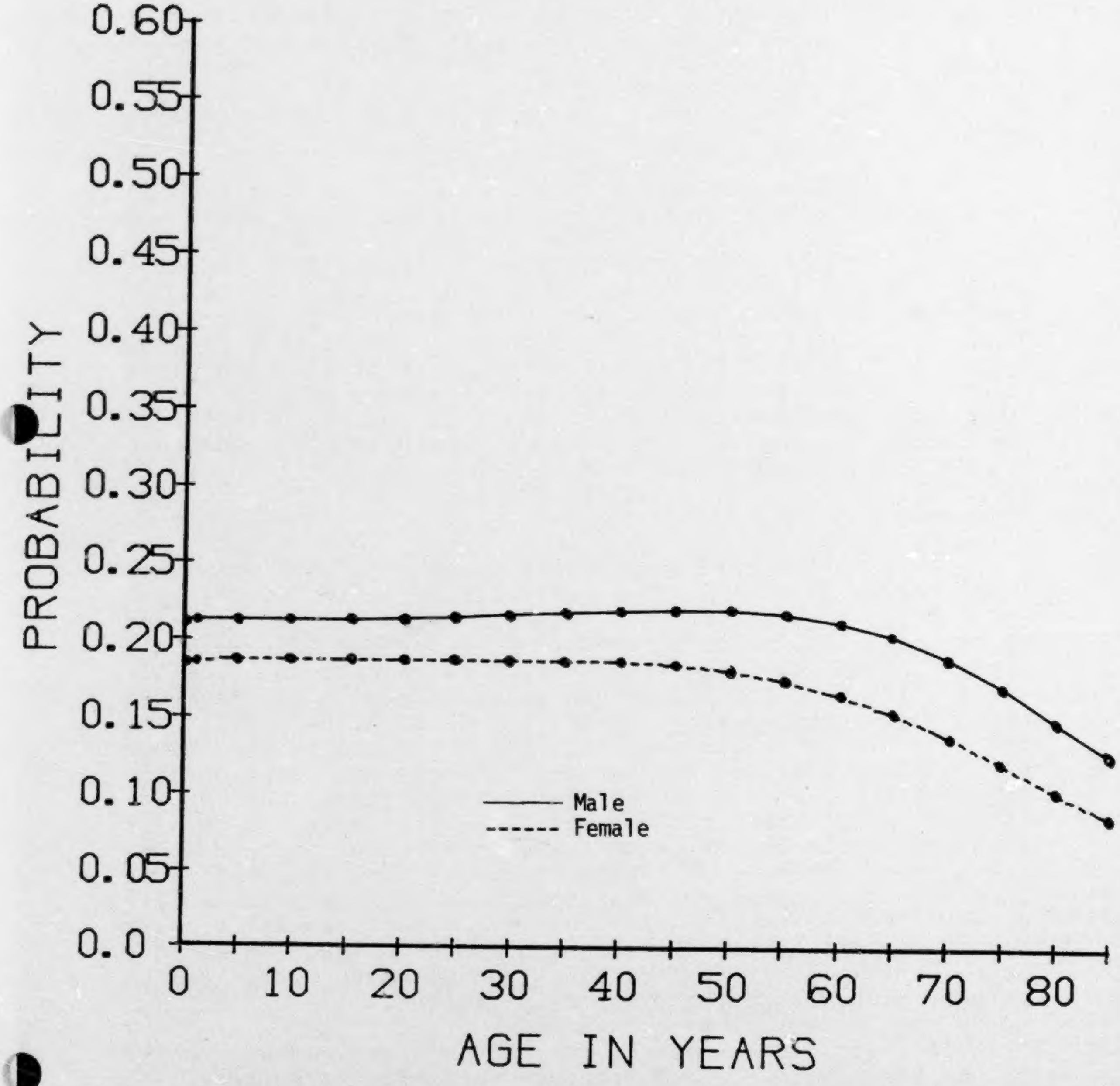
Table 2.16
Deaths Due to Malignant Neoplasms by Site Affected, Michigan Residents, 1981 (continued)

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
77	Malignant Neoplasms of Thyroid Gland and Other Endocrine Glands and Related Structures	51	0.3
58	Malignant Neoplasms of All Other and Ill-Defined Sites within the Respiratory System and Intrathoracic Organs	49	0.3
59	Malignant Neoplasms of Bone and Articular Cartilage	42	0.3
62	Other Malignant Neoplasms of Skin	42	0.3
68	Malignant Neoplasms of Other and Unspecified Female Genital Organs	38	0.2
43	Malignant Neoplasms of Small Intestine, including Duodenum	30	0.2
45	Malignant Neoplasms of Descending Colon	23	0.1
70	Malignant Neoplasms of Testis	17	0.1
76	Malignant Neoplasms of Other and Unspecified Parts of Nervous System	17	0.1
44	Malignant Neoplasms of Hepatic and Splenic Flexures and Transverse Colon	13	0.1
51	Malignant Neoplasms of Intrahepatic Bile Ducts	11	0.1
64	Malignant Neoplasms of Male Breast	11	0.1
74	Malignant Neoplasms of Eye	9	0.1
85	Monocytic Leukemia	9	0.1
37	Malignant Neoplasms of Lip	8	0.0
71	Malignant Neoplasms of Penis and Other Male Genital Organs	8	0.0
	Total	16,142	100.0

[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

0.184 for females at birth (Figure 2.15). The probability of eventually dying from cancer is greater for males than for females at all ages. The probability for males rises slowly to a peak of 0.221 by age 45 then declines to 0.127 at age 85. Probabilities for females display little change from birth to age 45, then diminish to 0.086 by age 85. This decreasing probability beyond age 45, noting the high cancer mortality rates of older age (Figure 2.11), indicates that age-specific death rates due to competing causes of death increase relatively faster with advancing age.

FIGURE 2.15 PROBABILITY OF EVENTUALLY DYING FROM CANCER BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

CEREBROVASCULAR DISEASE

Deaths due to cerebrovascular disease (stroke) numbered 6,121 in 1981 or 8.1 percent of the 75,818 total Michigan resident deaths. This is 43 fewer stroke deaths than were observed in 1980. Of the total in 1981, 58.8 percent were to females.

The median age at death from stroke was 79 years (Table 2.17). The median age for females was 81 years, 5 years higher than that for males. Deaths for white persons due to cerebrovascular disease displayed median ages several years higher than those for other than white persons. The median age was 68 years for other than white males and 77 years for white males. The median was 72 years for other than white females. This was 10 years less than that for white females (82 years).

The cerebrovascular disease death rate was 66.0 in 1981. The rate for females (75.8) was much higher than the rate for males (55.8). The age-specific death rates recorded in Table 2.18 and displayed in Figure 2.16 indicate that rates for males and females were similar below age 55. The rates for both sexes increased markedly in the older age groups. Rates for males were above those of females from age 55 through 84. Among persons 85 years of age or older the rate for females was above that for males. The crude death rate for females exceeded that for males because of the larger proportion of women in the high risk older age groups. The age-adjusted rate of 42.7 for males was 13 percent higher than the age-adjusted rate of 37.7 for females.

Cerebrovascular disease death rates by age and race from Table 2.18 are graphically displayed in Figures 2.17 and 2.18. Rates for other than white males and females were higher than comparable rates for white persons in all age groups below age 75 with sufficient events to calculate rates. The rate for other than white females also exceeded that for white females in the age group 75-84 years. The relative differentials progressively decreased in the older age groups. Rates for white persons were considerably higher than those for other than white persons beyond age 84. Although the crude rates for white males and females were, respectively, 15 percent and 40 percent higher than rates for other than white persons, age-adjusted rates indicate an opposite relationship. The cerebrovascular disease age-adjusted death rate for other than white males was 43 percent higher than that for white males, while for other than white females the age-adjusted rate was 50 percent higher than that for white females.

The historic pattern of cerebrovascular disease death rates has been one of strong variation (Figure 2.19).

Table 2.17
Deaths Due to Cerebrovascular Disease by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	7	5	2	3	2	1	4	3	1	-	-	-
1-4	2	2	-	1	1	-	1	1	-	-	-	-
5-9	4	1	3	3	1	2	1	-	1	-	-	-
10-14	2	-	2	1	-	1	1	-	1	-	-	-
15-19	3	1	2	3	1	2	-	-	-	-	-	-
20-24	9	7	2	7	5	2	2	2	-	-	-	-
25-29	27	15	12	14	10	4	13	5	8	-	-	-
30-34	35	12	23	23	10	13	12	2	10	-	-	-
35-39	39	20	19	26	14	12	12	6	6	1	-	1
40-44	51	26	25	32	17	15	19	9	10	-	-	-
45-49	91	47	44	65	34	31	26	13	13	-	-	-
50-54	166	82	84	118	59	59	48	23	25	-	-	-
55-59	223	109	114	160	80	80	63	29	34	-	-	-
60-64	349	184	165	272	139	133	77	45	32	-	-	-
65-69	491	237	254	404	193	211	86	43	43	1	1	-
70-74	727	361	366	618	307	311	108	53	55	1	1	-
75-79	923	435	488	820	389	431	102	46	56	1	-	1
80-84	1182	446	736	1091	414	677	89	32	57	2	-	2
85-89	1007	321	686	949	301	648	57	20	37	1	-	1
90+	783	209	574	745	203	542	38	6	32	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	6121	2520	3601	5355	2180	3175	759	338	421	7	2	5
Median Age At Last Birthday	79	76	81	80	77	82	70	68	72	*	*	*

Table 2.18
Cerebrovascular Disease Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

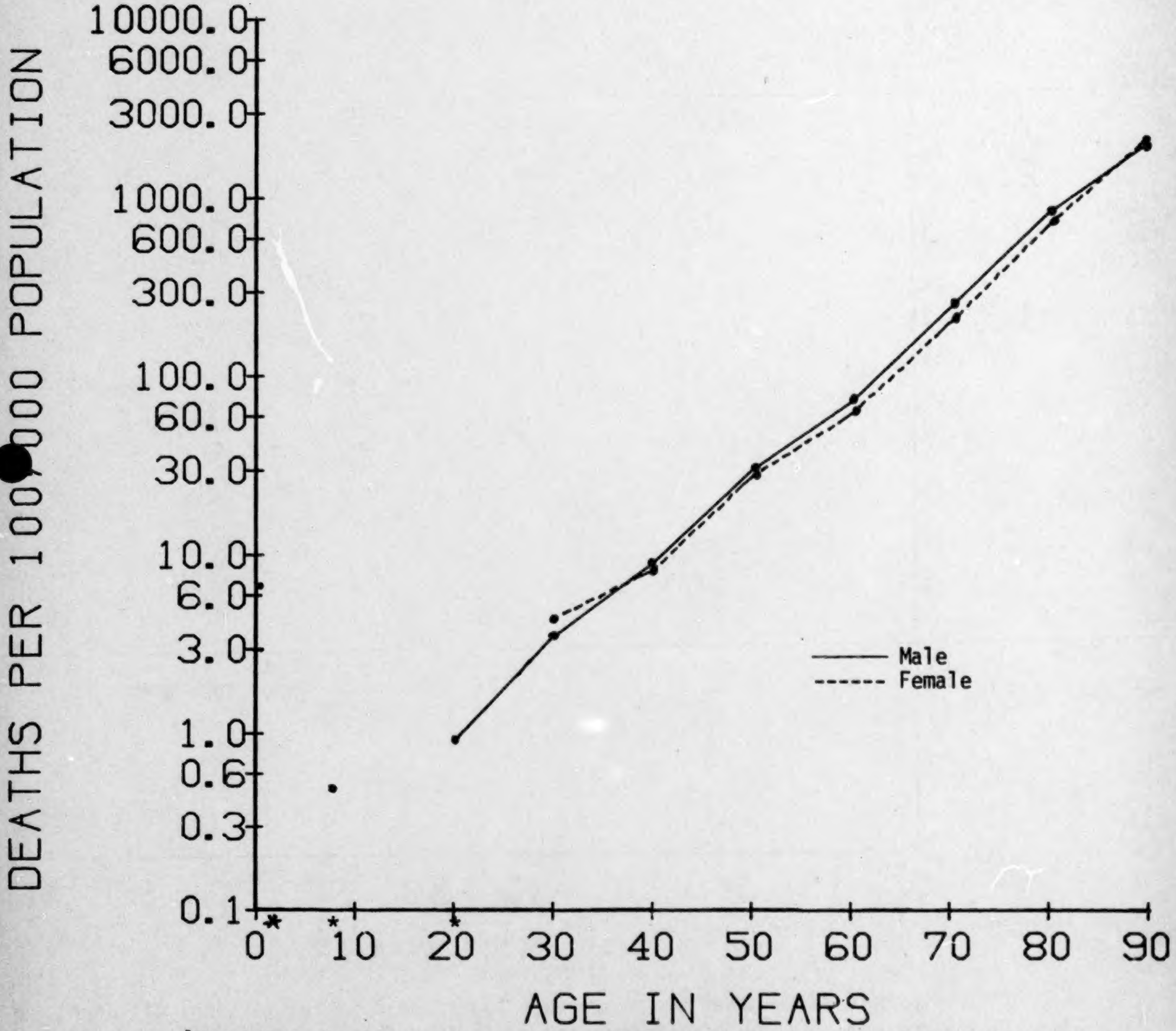
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	66.0	55.8	75.8	68.4	56.9	79.3	53.2	49.6	56.5
Under 1 Year	5.0	7.0	*	*	*	*	*	*	*
1-14 Years	.4	*	.5	.3	*	*	*	*	*
15-24 Years	.7	.9	*	.7	.8	*	*	*	*
25-34 Years	3.9	3.5	4.4	2.8	3.0	2.6	9.8	6.0	13.2
35-44 Years	8.5	8.9	8.2	6.5	6.9	6.1	21.1	21.8	20.4
45-54 Years	28.2	29.2	27.3	23.1	24.0	22.3	62.5	66.1	59.4
55-64 Years	65.5	70.7	60.8	55.9	59.7	52.5	138.8	156.2	123.5
65-74 Years	215.2	240.0	195.7	203.0	226.3	184.8	314.5	351.0	285.4
75-84 Years	746.8	827.0	698.1	748.9	839.0	695.0	726.5	721.0	730.4
85 Years and Over	2110.0	2015.7	2152.4	2162.0	2086.7	2195.6	1476.3	1215.0	1606.5
Age-Adjusted Rate[2]	39.8	42.7	37.7	37.5	40.5	35.3	55.4	57.8	53.1

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

FIGURE 2.16 AGE-SPECIFIC CEREBROVASCULAR DISEASE DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



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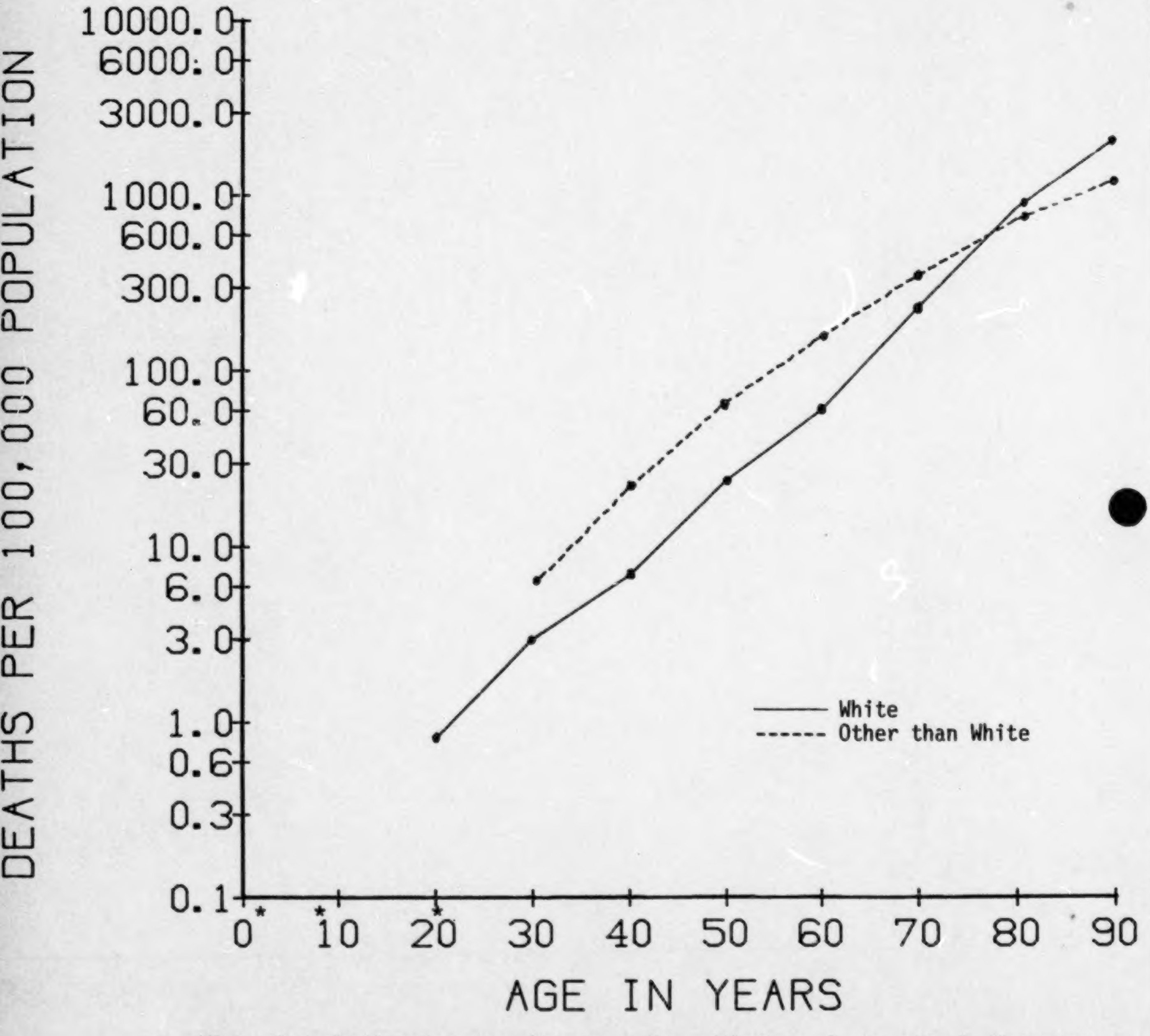
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.17 AGE-SPECIFIC CEREBROVASCULAR DISEASE DEATH RATES¹ BY RACE,

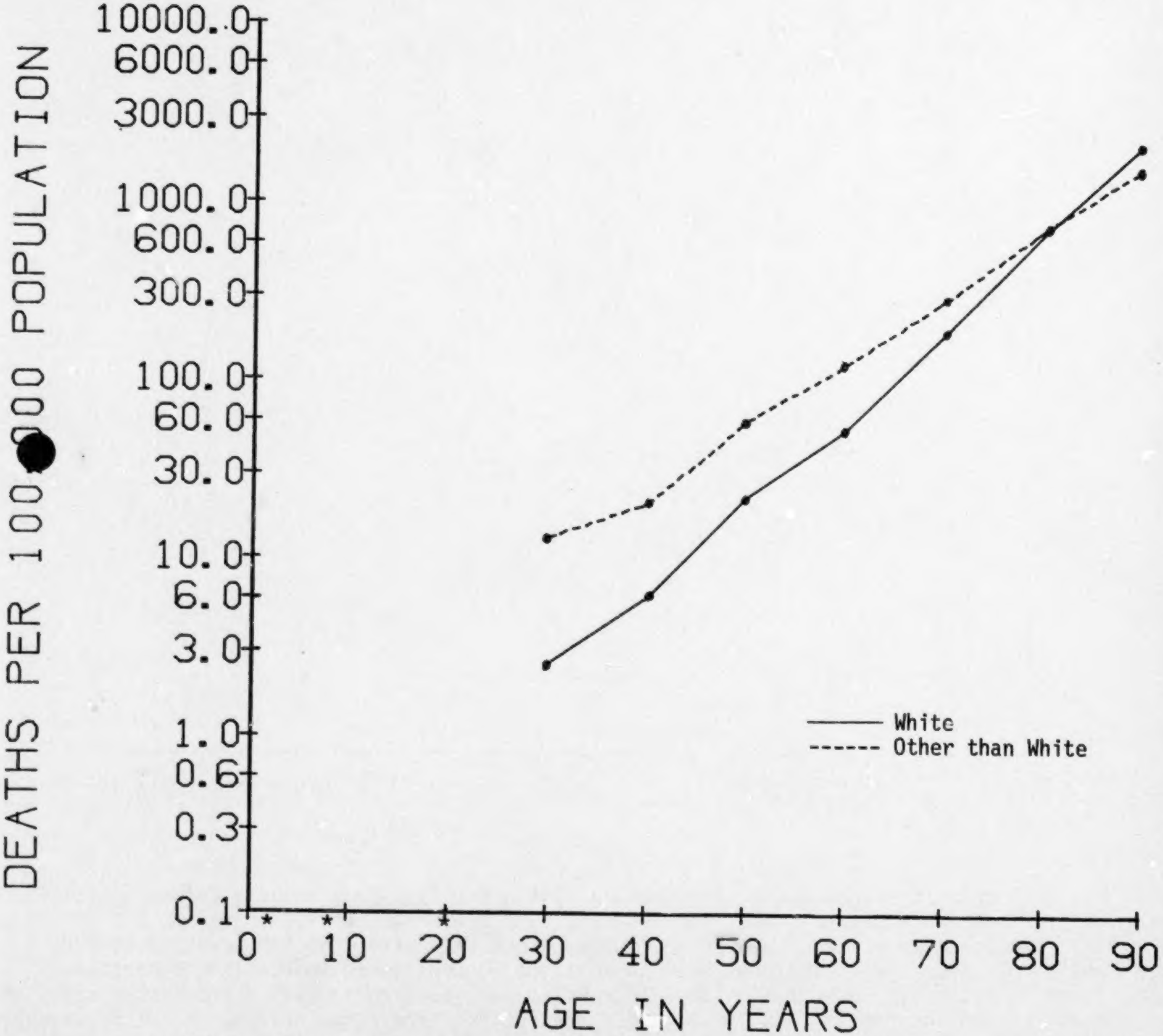
MICHIGAN RESIDENT MALES, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

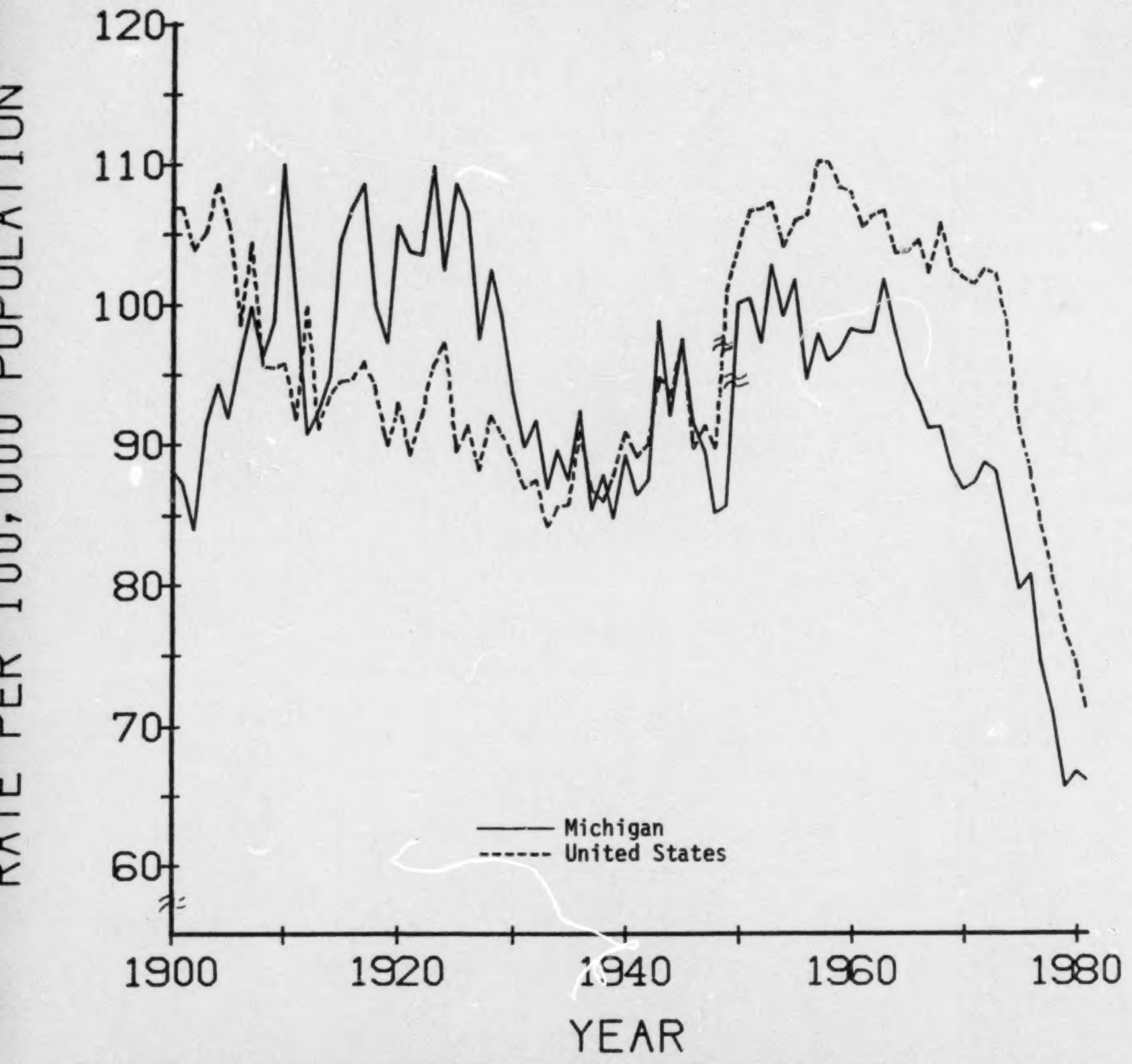
FIGURE 2.18 AGE-SPECIFIC CEREBROVASCULAR DISEASE DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1981



[1]Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.19 CEREBROVASCULAR DISEASE DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS,[1] 1900-1981[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. United States rates for 1980 and 1981 are provisional.

[2] The comparability of cerebrovascular disease death rates from the 5th revision of ICDA coding procedures with those of the 6th revision is considered weak. The comparability ratio is estimated to be 1.16. The 6th revision was adopted in 1949 for national cause-of death statistics and in 1950 for Michigan statistics. The comparability of cerebrovascula disease death rates through the 6th, 7th, 8th and 9th revisions (1949 to date nationally a 1950 to date in Michigan) is high. General comparison before and after these dates can [illegible] made but detailed study requires special consideration. See Technical Notes.

During the time period 1900-1949, the rates in Michigan ranged from a low of 83.9 in 1902 to a high of 110.0 eight years later. The national high and low rates for the years 1900-1948 were, respectively, 108.6 in 1904 and 84.1 in 1933. Rates for Michigan were below national rates from 1900 through 1907 but were generally, and sometimes markedly, higher from 1908 through 1938. Michigan and national rates were very similar over the next eight years, whereupon the Michigan rate slipped below the national rate and has so remained since 1947.

The 6th revision to ICD cause of death coding was adopted in the year 1949 nationally and in 1950 in Michigan. This revision resulted in a lack of direct comparability between cerebrovascular disease death rates prior to these dates and those after adoption. Since the significant change in coding procedures, the cerebrovascular disease death rate in Michigan has ranged from a high of 102.8 in 1953 to a low of 65.6 in 1979. Recent rates over the last eighteen years have shown a clear downward tendency both nationally and in Michigan. The rate of 66.0 for Michigan in 1981 was 35.1 percent below the rate of 1963. In 1981 the Michigan rate was 8 percent below the provisional United States rate of 71.7.

Age-adjusted rates for cerebrovascular disease deaths by race and sex are presented in Table 2.19. These rates have declined by approximately 40 percent since 1970 for each sex-race group in Michigan. Rates for other than white persons, however, remained substantially above rates for white persons throughout the period. Rates for the United States showed a similar pattern of decline. However, while Michigan and national rates were quite similar for white males and females, the state age-adjusted rates for other than white males and females were lower than comparable national rates (see Technical Notes).

Acute but ill-defined cerebrovascular disease was most frequently given as the type of cerebrovascular disease causing death (2,782 deaths). Second in frequency was cerebral thrombosis and unspecified occlusion of cerebral arteries which caused 1,364 deaths in 1981 (Table 2.20). These two cause of death categories comprised 67.7 percent of all stroke deaths. Intracerebral and other intracranial hemorrhage caused 753 stroke deaths.

Based upon the mortality experience of 1979 through 1981, at birth a Michigan male faces a 0.072 chance of dying from cerebrovascular disease while the probability for a female at birth is 0.118. For both sexes the probability of eventual death due to this cause increases with advancing age. At all ages females are more likely to eventually die from this cause than are males (Figure 2.20). This results primarily from the higher risks from competing causes for

Table 2.19
Age-Adjusted Cerebrovascular Disease Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	64.7	70.8	59.9	61.5	67.9	56.5	93.9	95.4	92.2
	1971	63.7	72.5	56.7	61.0	70.5	53.5	86.3	88.5	84.4
	1972	63.3	69.5	58.2	60.7	66.7	55.6	83.8	90.7	77.3
	1973	61.4	67.4	56.4	59.0	65.1	54.0	79.7	84.5	75.7
	1974	57.8	64.7	52.2	55.6	62.6	50.1	73.0	79.9	66.8
	1975	53.9	60.1	49.0	52.2	58.1	47.7	65.6	74.9	57.7
	1976	53.1	58.0	49.3	51.3	56.4	47.4	65.4	69.7	61.7
	1977	48.4	54.0	44.0	46.6	52.1	42.3	62.1	69.5	56.4
	1978	45.2	49.3	42.0	43.1	47.5	39.7	60.3	61.3	59.0
	1979	40.9	46.3	36.8	38.8	44.2	34.7	56.3	61.5	51.8
	1980	40.6	44.9	37.4	38.3	42.6	35.1	57.1	61.3	53.6
	1981	39.8	42.7	37.7	37.5	40.5	35.3	55.4	57.8	53.1
U.S.	1970	66.3	73.2	60.8	61.8	68.8	56.2	107.0	113.5	101.4
	1971	65.7	72.5	60.2	61.5	68.4	56.1	108.1	115.9	101.7
	1972	65.0	72.7	59.1	61.0	68.8	54.9	101.3	107.8	96.0
	1973	63.7	70.4	58.5	59.6	66.3	54.5	99.7	106.7	93.8
	1974	59.9	66.5	54.9	56.4	63.0	51.4	90.9	98.3	84.7
	1975	54.5	60.6	49.8	51.3	57.4	46.8	82.0	89.3	76.1
	1976	51.4	56.8	47.3	48.5	53.7	44.5	77.6	84.6	72.0
	1977	48.2	53.5	44.2	45.3	50.5	41.5	73.4	79.8	68.0
	1978	45.3	49.8	41.8	42.5	46.8	39.3	69.3	76.5	63.4
	1979	42.5	46.7	39.2	39.8	43.8	36.8	65.1	71.9	59.4
	1980	41.5[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

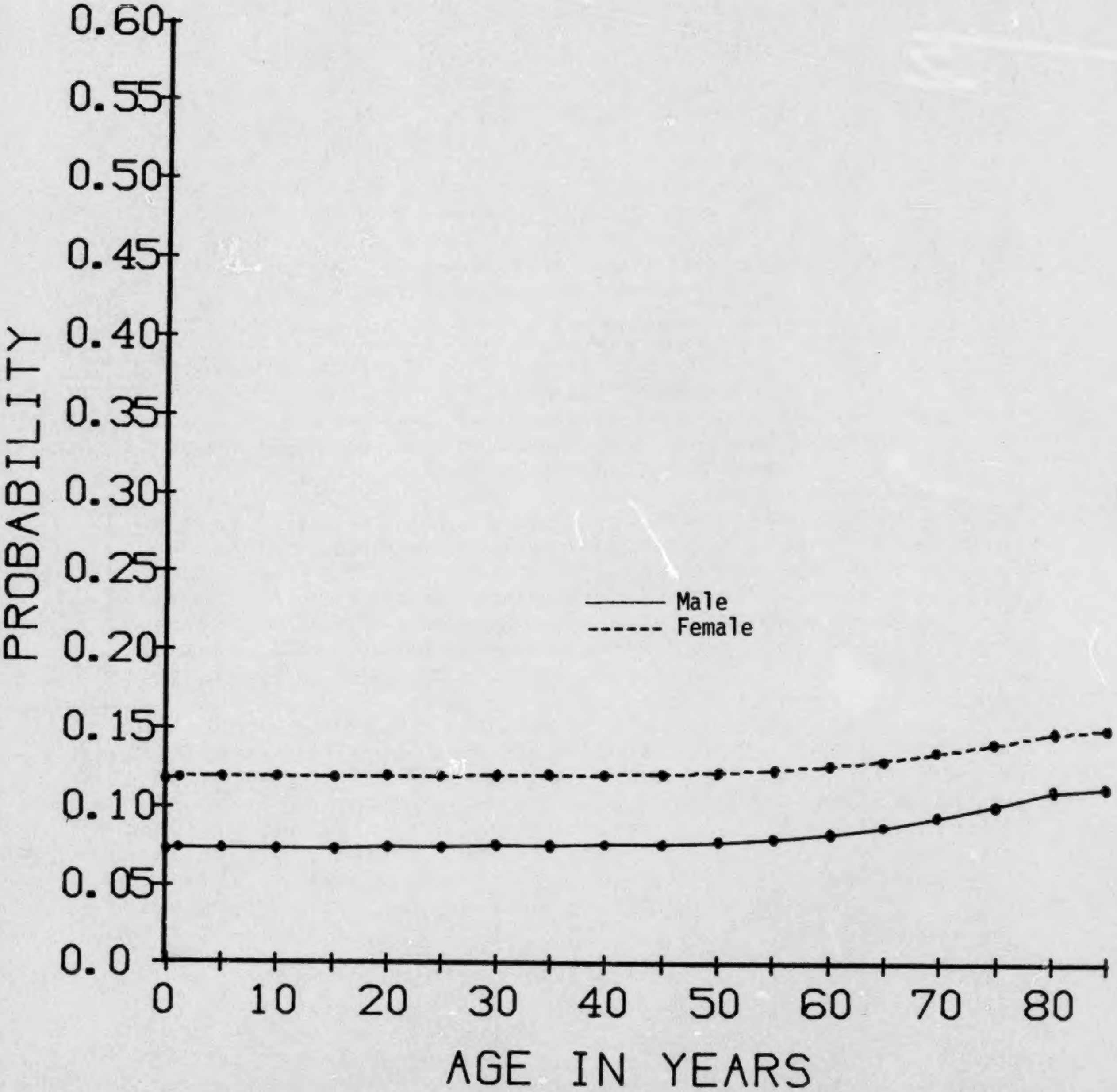
[2] Provisional.

Table 2.20
Deaths Due to Cerebrovascular Diseases by Specific Cause, Michigan Residents, 1981

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
154	Acute but Ill-Defined Cerebrovascular Disease . .	2,782	45.5
152	Cerebral Thrombosis and Unspecified Occlusion of . Cerebral Arteries	1,364	22.3
155	Other and Late Effects of Cerebrovascular Diseases	825	13.5
150	Intracerebral and Other Intracranial Hemorrhage .	753	12.3
149	Subarachnoid Hemorrhage	289	4.7
151	Occlusion and Stenosis of Precerebral Arteries . .	79	1.3
153	Cerebral Embolism	29	0.5
	Total	6,121	100.0

[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

Figure 2.20 Probability of Eventually Dying from Cerebrovascular Disease by Age and Sex, Michigan Residents, 1979-1981[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

males. At age 60 probabilities for males start rising appreciably, reaching 0.113 by age 85. Data for females reveal a similar tendency, though the increase is more moderate. The peak probability for females is 0.150 at age 85.

ACCIDENTS

About 4.5 percent of all Michigan resident deaths in 1981 were attributed to accidents. The total of 3,390 accidental deaths is 237 fewer than in 1980. The number of deaths from motor vehicle accidents was 1,727 in 1981, 153 fewer than in the previous year. In 1981 70.3 percent of the total accidental deaths were to males, and 72.0 percent of the deaths from motor vehicle accidents were to males.

The median age at death among accident victims was 35 years (Table 2.21). The median age among males was 32, thirteen years lower than the 45 year median for females. This differential is predominantly traceable to the relatively large number of accidental deaths of white males in the younger age intervals. The median age of accidental death for white males was 31 years compared to 35 years for other than white males. For white females who died from accidents the median of 47 years was 9 years higher than that for their other than white counterparts.

Accidental deaths among white males were especially concentrated in the 15-19 year and 20-24 year age ranges. These two age groups accounted for 26 percent of accidental deaths for white males compared to 17 percent or less for all other race/sex categories.

The crude death rate from accidents for males was 2.5 times that for females. Age-specific accident death rates for males were greater than those for females in all age groups. The differentials between rates for males and females were greatest between ages 15 and 44. In the 25-34 year age group, the rate for males was 3.9 times that for females. The age-adjusted death rate for males was 2.9 times that for females (Table 2.22).

Accident mortality rates by sex contained in Table 2.22 are displayed graphically in Figure 2.21. Although age-specific rates for males are generally much higher than those for females, the patterns of change are quite similar. Mortality rates for children between 1 and 14 years of age were somewhat lower than those for infants under one year. The rates then rose sharply for both sexes in the 15-24 year age group. From this initial peak the rates for both groups declined somewhat, remained fairly constant through age 54, and then increased continuously beyond that age.

Age-specific accident death rates for white and other than white persons are graphically displayed in Figures 2.22 and 2.23. Rates for white males were higher than those for other than white males only in the 15-24 and 25-34 year age groups. The largest relative differential in rates for white and other white females was in the 15-24 year age group where the rate for white females was 3.6 times the

Table 2.21
Deaths Due to Accidents by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	41	22	19	30	14	16	11	8	3	-	-	-
1-4	132	84	48	98	62	36	34	22	12	-	-	-
5-9	96	63	33	76	51	25	20	12	8	-	-	-
10-14	117	87	30	101	74	27	15	12	3	1	1	-
15-19	328	257	71	314	246	68	14	11	3	-	-	-
20-24	394	310	84	373	294	79	19	14	5	2	2	-
25-29	328	261	67	287	230	57	41	31	10	-	-	-
30-34	255	199	56	200	160	40	53	37	16	2	2	-
35-39	189	147	42	158	123	35	30	23	7	1	1	-
40-44	161	118	43	135	96	39	24	21	3	2	1	1
45-49	126	89	39	105	71	34	21	17	4	2	1	1
50-54	155	118	37	130	98	32	23	18	5	2	2	-
55-59	150	99	51	118	78	40	31	20	11	1	1	-
60-64	145	102	43	122	85	37	22	16	6	1	1	-
65-69	125	96	29	108	83	25	17	13	4	-	-	-
70-74	141	72	69	122	63	59	18	9	9	1	-	1
75-79	135	79	56	117	69	48	18	10	8	-	-	-
80-84	136	84	52	127	76	51	9	8	1	-	-	-
85-89	137	63	74	131	60	71	6	3	3	-	-	-
90+	97	33	64	91	32	59	6	1	5	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	3390	2383	1007	2943	2065	878	432	306	126	15	12	3
Median Age At Last Birthday	35	32	45	34	31	47	35	35	38	*	*	*

Table 2.22
Accident Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

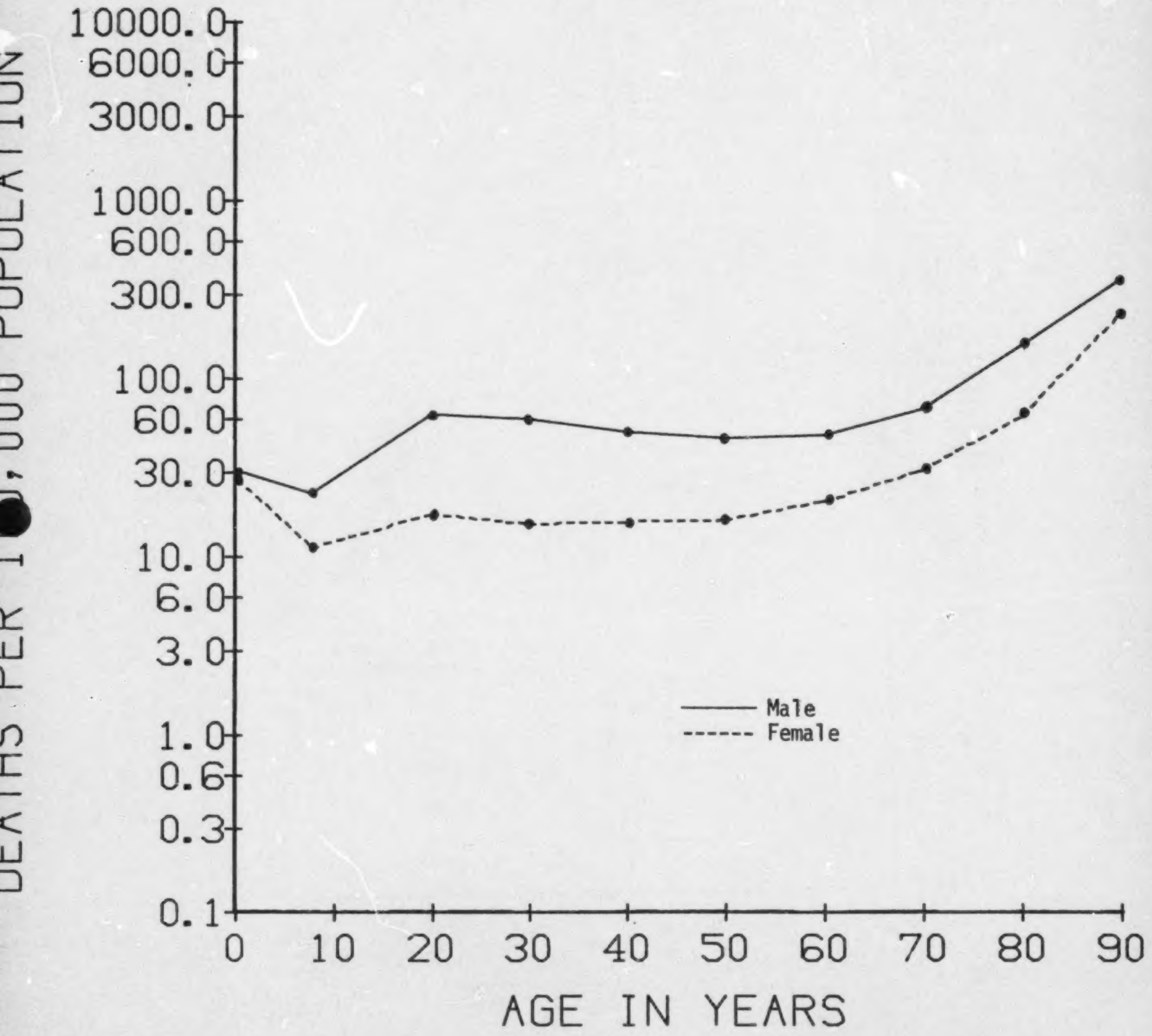
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	36.6	52.8	21.2	37.7	54.1	22.0	30.4	45.1	17.0
Under 1 Year	29.1	30.7	27.5	26.6	24.3	29.1	39.3	56.9	*
1-14 Years	17.1	22.7	11.3	17.1	22.7	11.2	17.2	22.8	11.5
15-24 Years	40.9	64.3	17.5	46.4	72.8	19.9	11.7	18.3	5.5
25-34 Years	37.1	59.3	15.4	37.0	59.4	14.7	37.3	58.7	19.0
35-44 Years	33.1	51.1	15.8	32.5	49.2	16.3	36.7	64.0	12.7
45-54 Years	31.1	46.8	16.2	30.2	44.4	16.6	37.1	64.3	14.1
55-64 Years	33.8	48.5	20.5	31.3	45.0	19.0	52.6	76.0	31.8
65-74 Years	47.0	67.4	30.9	45.6	65.8	29.7	58.4	80.4	40.8
75-84 Years	96.1	153.0	61.6	95.5	151.5	61.9	102.7	166.4	58.2
85 Years and Over	275.8	365.1	235.7	283.2	380.9	239.7	186.5	*	186.3
Age-Adjusted Rate[2]	33.6	50.6	17.7	34.1	51.1	18.0	31.6	48.9	16.6

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

FIGURE 2.21 AGE-SPECIFIC ACCIDENT DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



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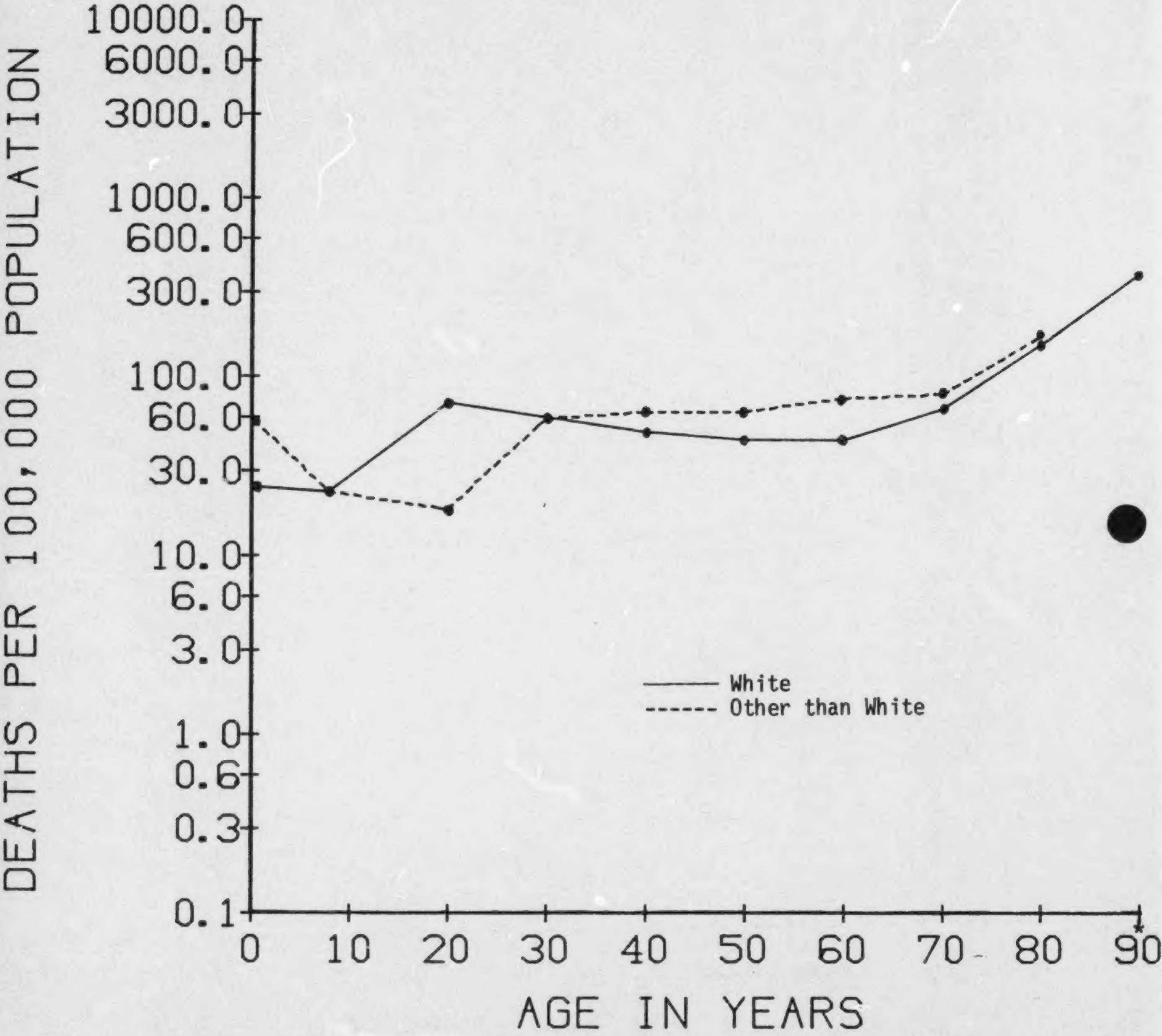
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.22 - AGE-SPECIFIC ACCIDENT DEATH RATES[1] BY RACE, MICHIGAN RESIDENT MALES, 1981



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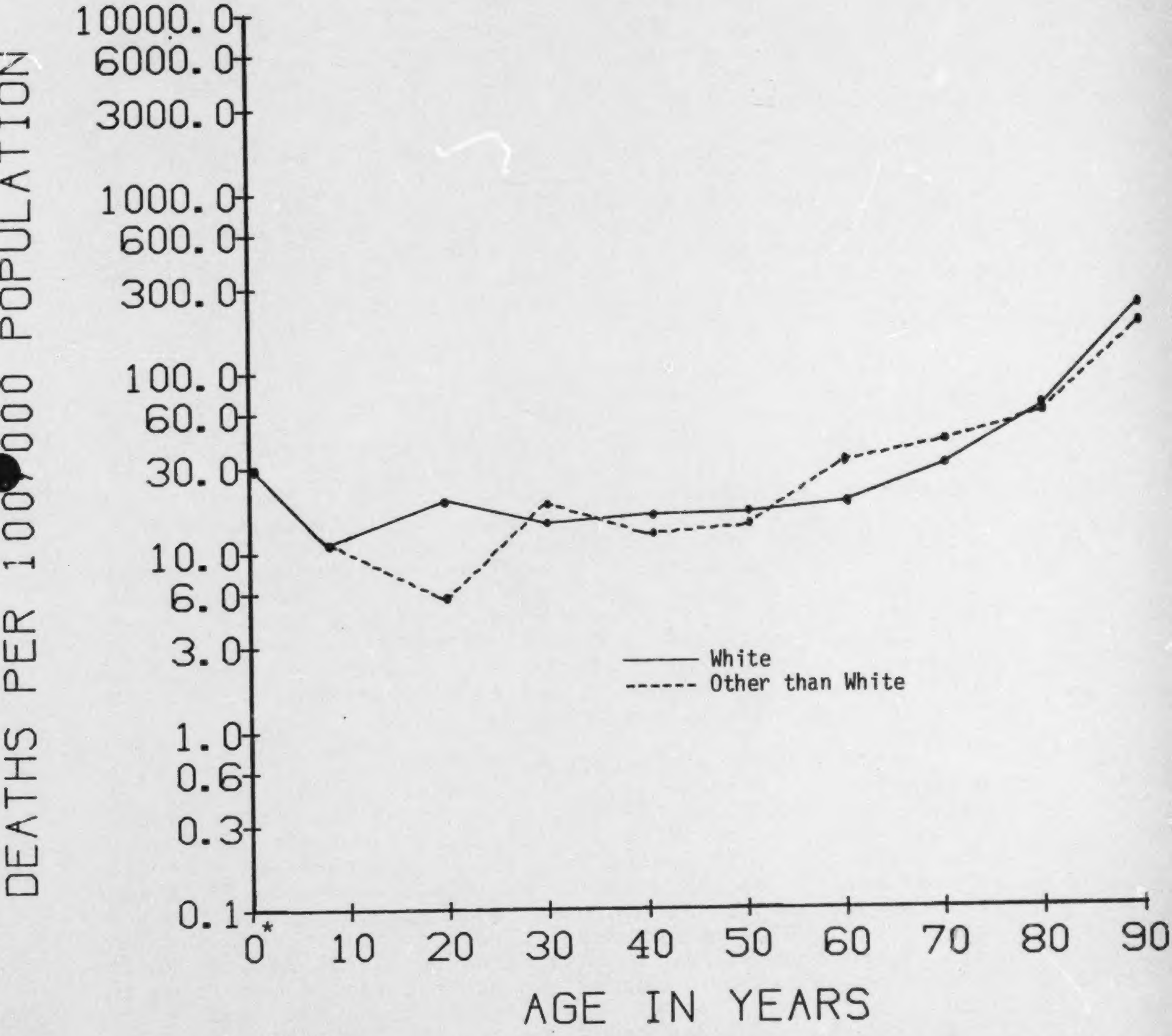
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

FIGURE 2.23 AGE-SPECIFIC ACCIDENT DEATH RATES[1] BY RACE, MICHIGAN RESIDENT FEMALES, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

rate for other than white females. Both crude and age-adjusted accident death rates for white persons were higher than those for other than white persons (Table 2.22).

Michigan's accident death rate in 1900 was 71.9. The highest rate observed in this century was 103.1 in 1936, and the rate of 36.6 in 1981 is the lowest rate of the century. In seven of the last eight years the accident death rate has fallen or remained the same. The rate in 1981 was 28 percent lower than that of 1973. The death rate from motor vehicle accidents was 18.6 in 1981. This is the lowest motor vehicle accident death rate for Michigan since 1958 (see Table 4.8).

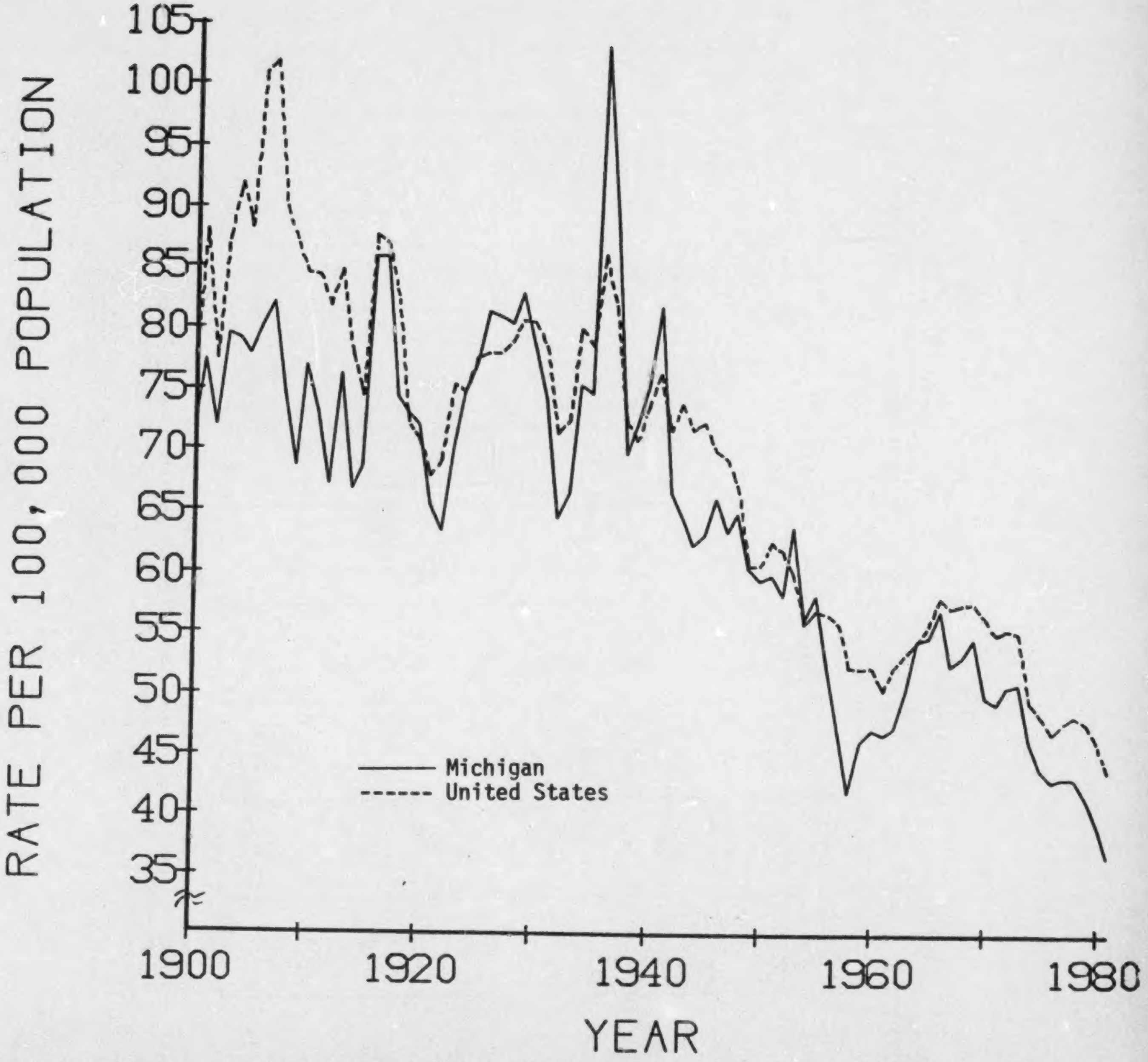
The highest national accident death rate was 101.8 in 1907. The lowest national rate of the century is the provisional rate of 44.5 for 1981. Michigan's rates have been below national rates fairly consistently since 1900. The last time Michigan's rate was above that of the United States was in 1964. The accident death rate for Michigan in 1981 was 18 percent below the provisional rate of 44.5 for the nation (Figure 2.24).

Michigan's age-adjusted death rates for accidental deaths have also been below the comparable national rates since 1970 (Table 2.23). Between 1970 and 1981 Michigan's age-adjusted rate declined by 31 percent. Between 1970 and 1980 the national age-adjusted rate declined by 19 percent (see Technical Notes). Michigan's rate was 16 percent below the national rate in 1980. The age-adjusted rates by race and sex declined for each population subgroup during this period. The most significant declines occurred in the rates for other than white males and females (42 percent and 46 percent, respectively). In Michigan the rate for all other than white persons was 18 percent higher than that for white persons in 1970 but was 7 percent lower in 1981. This differential declined nationally from 43 percent higher in 1970 to 18 percent higher in 1979.

Motor vehicle accidents involving collision with another motor vehicle was the largest single cause of accidental death in 1981, resulting in 684 deaths (Table 2.24). Deaths from all types of motor vehicle accidents accounted for 1,727 deaths in 1981. Accidental falls of all types resulted in 468 deaths. Accidents caused by fires and flames, accidental drownings, and accidental poisonings caused 243, 183, and 149 deaths, respectively. Choking on food or other objects was the cause of 129 deaths, while accidents caused by handguns and other firearms resulted in the deaths of 51 Michigan residents. Air and space transport accidents caused 47 deaths (Table 2.25).

Deaths from motor vehicle accidents accounted for 50.9 percent of all accidental deaths in 1981. This proportion

FIGURE 2.24 ACCIDENT DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS,[1] 1900-1981[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. U.S. rates for 1980 and 1981 are provisional.

[2] Accidental death rates since 1900 are suitable for general comparison over time but detaile study (such as time series) requires special consideration. See Technical Notes.

Table 2.23
Age-Adjusted Accident Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	48.6	71.3	27.4	47.5	69.6	26.8	56.1	83.9	30.7
	1971	47.7	69.9	26.8	46.8	68.3	26.5	54.1	83.1	27.8
	1972	48.7	72.9	25.9	48.4	72.2	25.9	50.9	78.8	25.6
	1973	48.9	72.4	26.6	48.2	71.2	26.2	53.1	81.1	27.7
	1974	43.8	65.5	23.2	43.5	64.5	23.4	46.2	73.5	21.6
	1975	41.5	61.7	22.4	41.3	61.4	22.3	42.9	65.1	23.0
	1976	40.0	58.7	22.4	40.3	58.9	22.7	38.1	58.8	19.9
	1977	40.4	59.1	22.8	40.6	59.2	22.9	39.4	59.6	21.5
	1978	40.3	59.5	22.2	40.6	59.9	22.1	40.0	59.7	23.0
	1979	38.4	56.2	21.8	38.7	56.3	22.1	37.5	57.9	19.7
	1980	36.4	53.3	20.6	36.6	52.8	21.4	35.8	58.6	16.0
	1981	33.6	50.6	17.7	34.1	51.1	18.0	31.6	48.9	16.6
U.S.	1970	53.7	80.7	28.2	51.0	76.2	27.2	72.8	115.7	35.1
	1971	52.0	77.1	28.2	49.4	72.9	27.0	71.6	117.7	36.1
	1972	52.0	77.5	28.0	49.8	73.5	27.2	68.8	109.3	33.4
	1973	51.7	77.4	27.4	49.5	73.6	26.4	67.5	106.8	33.2
	1974	46.0	69.4	23.8	44.3	66.6	22.9	58.5	92.3	29.0
	1975	44.8	67.7	23.1	43.1	64.8	22.4	56.9	90.7	27.6
	1976	43.2	64.7	22.7	41.8	62.3	22.2	53.2	84.6	25.8
	1977	43.8	65.5	23.2	42.5	63.2	22.7	53.1	84.5	25.8
	1978	44.3	66.5	23.3	43.3	64.5	22.9	52.6	83.1	26.1
	1979	43.7	66.2	22.4	42.9	64.5	22.0	50.5	80.5	24.6
	1980	43.4[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Provisional.

Table 2.24
Deaths Due to Accidents by Type of Accident, Michigan Residents, 1981

282 LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
236	Motor Vehicle Accidents Involving Collision with Another Motor Vehicle	684	20.2
252	Fracture, Cause Unspecified, and Other and Unspecified Falls	340	10.0
239	Motor Vehicle Accidents Not Involving Collision on Highway	325	9.6
237	Motor Vehicle Accidents Involving Collision with Pedestrain	285	8.4
262	All Other Accidents, and Late Effects of Accidental Injury	252	7.4
238	Motor Vehicle Accidents Involving Collision with Other Vehicle or Object	248	7.3
253	Accidents Caused by Fires and Flames	243	7.2
255	Accidental Drowning and Submersion	183	5.4
256	Inhalation and Ingestion of Food or Other Object Causing Obstruction of Respiratory Tract or Suffocation	129	3.8
250	Fall From One Level to Another	119	3.5
240	Motor Vehicle Traffic Accidents of Unspecified Nature	106	3.1
246	Accidental Poisoning by Drugs, Medicaments, and Biologicals	71	2.1
248	Accidental Poisoning by Gases and Vapors	69	2.0
241	Motor Vehicle Nontraffic Accidents	51	1.5
258	Accidents Caused by All Other and Unspecified Firearms	47	1.4
244	Air and Space Transport Accidents	47	1.4
249	Misadventures During Medical Care, Abnormal Reactions, and Late Complications	39	1.2
243	Water Transport Accidents	35	1.0
261	Accidents Caused by Electric Current	29	0.9
235	Motor Vehicle Accidents Involving Collision with Train	28	0.8
260	Accidents Caused by Hot Substance or Object, Caustic or Corrosive Material, Steam, and Exposure to Radiation	10	0.3
247	Accidental Poisoning by Other Solid or Liquid Substances	9	0.3
263	Drugs, Medicaments, and Biological Substances Causing Adverse Effects in Therapeutic Use	9	0.3
251	Fall on Same Level	9	0.3
259	Accidents Caused by Explosive Material	6	0.2
242	Other Road Vehicle Accidents	5	0.1
234	Railway Accidents	5	0.1
257	Accident Caused by Handgun	4	0.1
254	Lightning	3	0.1
	Total	3,390	100.0

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[1] List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

Table 2.25
Deaths Due to Accidents by Age at Death and Type of Accident, Michigan Residents, 1981

TYPE OF ACCIDENT	AGE AT DEATH IN YEARS					
	TOTAL	<15	15-24	25-44	45-64	65+
Total	3,390	386	722	933	578	771
Motor Vehicle Accidents	1,727	157	550	558	252	210
Accidental Falls	468	13	13	49	82	311
Accidents Caused by Fires and Flames	243	77	19	51	42	54
Accidental Drownings	183	57	40	46	24	16
Accidental Poisonings	149	5	25	67	34	18
Choking on Food or Other Object	129	13	5	26	33	52
Accidents Caused by Handguns and Other Firearms	51	12	16	14	6	3
Air and Space Transport Accidents	47	-	1	25	21	-
Misadventures During Medical Care, Abnormal Reactions, and Late Complications	39	3	1	5	5	25
Water Transport Accidents	35	2	10	12	8	3
All Other Accidents	319	47	42	80	71	79

of accident deaths varied by age group, from a low of 27.2 percent of accident deaths for persons 65 years of age or older to 76.2 percent for persons 15-24 years of age (Table 2.25). Among children under 15 years the most frequent causes of accidental death were motor vehicle accidents, fires, and drownings, resulting in 157, 77, and 57 deaths respectively in 1981. Motor vehicle accidents and drowning were the leading causes of accidental death among persons 15-24 years of age. Motor vehicle accidents and poisonings were the leading causes of accidental death among persons 25-44 years of age, resulting in 59.8 percent and 7.2 percent, respectively, of all accidental deaths in this age group. Accidental falls, which caused 13.8 percent of all accidental deaths, were the cause of 40.3 percent of the accidental deaths among persons 65 years of age or older.

Table 2.26 displays the distribution of motor vehicle accident deaths by the age of the deceased person and the type of involvement of the deceased in the accident. Of the 1,727 persons killed in motor vehicle accidents in 1981, 680 (39.4 percent) were driving motor vehicles other than motorcycles at the time of the fatal accident. There were 317 deaths of passengers in motor vehicles other than motorcycles, while 307 pedestrians were killed in motor vehicle accidents. Motorcycle accidents resulted in the deaths of 125 motorcyclists and 9 motorcycle passengers. It should be noted that for 248 deaths (14.4 percent of the total) the type of involvement of the deceased in the accident was not stated.

The type of involvement of the deceased in the accident varied by age. The majority of children under age 15 killed in motor vehicle accidents were either pedestrians (50.3 percent) or passengers (29.9 percent). Nearly two thirds of the persons 15-24 years of age who died in motor vehicle accidents in 1981 were either drivers (39.5 percent) or passengers (23.3 percent) of motor vehicles other than motorcycles. Among persons 25-44 years and 45-64 years of age 48.2 percent and 48.4 percent respectively were driving motor vehicles other than motorcycles at the time of the accident. Pedestrians accounted for 29.5 percent of all motor vehicle accident deaths among persons 65 years of age or older, compared to 17.8 percent for persons of all ages.

Of the total 3,390 accidental deaths, 1,721 or 50.8 percent of the accidents occurred on streets and highways (Table 2.27). The second most common place of occurrence was the home with 722 deaths (21.3 percent). There were 71 deaths attributed to accidents at industrial places and premises, 50 in public buildings, and 50 on farms. Note that the place of injury was not specified for 12.5 percent of the accidental deaths.

It can be seen from Figure 2.25 that the probability of

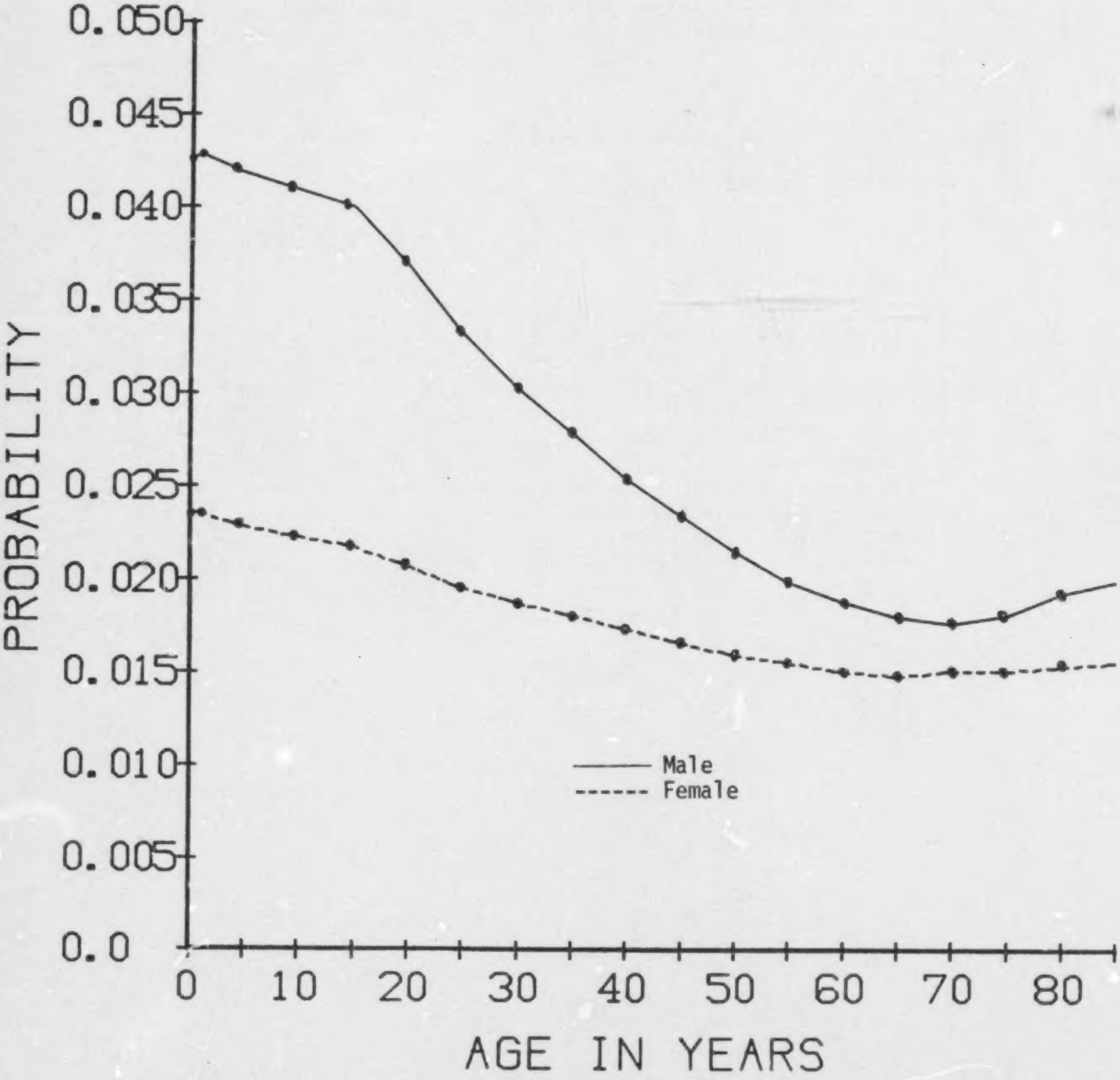
Table 2.26
Deaths from Motor Vehicle Accidents by Person Injured and Age at Death, Michigan Residents, 1981

PERSON INJURED	AGE AT DEATH IN YEARS					
	TOTAL	<15	15-24	25-44	45-64	65+
Total	1,727	157	550	558	252	210
Driver of Motor Vehicle Other Than Motorcycle	680	3	217	269	122	69
Passenger in Motor Vehicle Other Than Motorcycle	317	47	128	61	36	45
Motorcyclist	125	3	46	63	11	2
Passenger on Motorcycle	9	-	4	3	2	-
Pedal Cyclist	40	19	11	5	2	3
Pedestrain	307	79	57	68	41	62
Other Specified Person	1	-	1	-	-	-
Unspecified Person	248	6	86	89	38	29

Table 2.27
Deaths Due to Accidents by Place of Injury, Michigan Residents, 1981

PLACE	NUMBER OF DEATHS
Street and Highway	1,721
Home	722
Industrial Place and Premises	71
Public Building	50
Farm	50
Resident Institution	47
Place for Recreation and Sport	26
Mine and Quarry	8
Other Specified Places	271
Place Not Specified	424
Total	3,390

FIGURE 2.25 PROBABILITY OF EVENTUALLY DYING FROM ACCIDENTAL CAUSES BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

eventually having an accidental death is greater for the younger persons. According to Michigan mortality data from the years 1979 through 1981 the probability of eventually dying from accidental causes is 0.043 for males and 0.024 for females at birth. Probabilities for males decline slowly through childhood and the teenage years, fall by 36 percent between ages 15 and 40, and thereafter decline more slowly until the lowest probability of 0.018 is reached at age 70. For females the probabilities decline more moderately and steadily. Probabilities for males remain much higher than for females until about age 45 and slightly higher after that age.

CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS

The fifth leading cause of death in 1981 was chronic obstructive pulmonary diseases and allied conditions. This group of diseases caused 2,203 Michigan resident deaths, an increase of 6.9 percent from the 1980 figure. Of the 2,203 deaths, 1,516 (68.8 percent) were to males (Table 2.28).

The median age at death of persons who died from these respiratory diseases was 73 years, slightly higher than the median of 72 years for deaths from all causes. However, unlike deaths from all causes where the median for females was substantially higher than for males (76 years and 69 years), the median age of females who died from chronic obstructive pulmonary diseases and allied conditions was lower than that for males (72 years compared to 73 years). The median age for white persons (73 years) was four years higher than that for persons of other races (69 years).

The crude death rate for chronic obstructive pulmonary diseases and allied conditions was 23.8 per 100,000 population. The crude death rate for males was 2.3 times that for females (Table 2.29). Age-specific rates for males and females from Table 2.29 are graphically presented in Figure 2.26. The strong association between chronic obstructive pulmonary diseases and allied conditions and increasing age is clearly evident. Note also that age-specific rates for males are as high or higher than those for females in all age groups with sufficient events to calculate rates. The relative differential between rates for males and females increases steadily with age. In the age group 85 years and over the rate for males is 4.9 times that for females. The age-adjusted death rate for this group of diseases was 2.8 times as high for males as it was for females (26.4 and 9.3 deaths per 100,000 population respectively).

Age-specific rates for white and other than white persons are displayed in Figure 2.27. Rates were higher for other than white persons prior to age 55, after which they were higher for white persons. The age-adjusted death rate from these respiratory diseases for white persons was 26 percent above that for other than white persons.

Table 2.30 presents age-adjusted death rates by sex and race for the period 1970-1981 for deaths from this group of respiratory diseases. The age-adjusted death rates for males remained fairly constant over the decade, while for females the rate in 1981 was 66 percent higher than in 1970. The increase in age-adjusted rates for females was mainly due to an even larger increase (76 percent) in rates for white females, while the rate for other than white females was 9 percent higher in 1981 than in 1970. The age-adjusted death rate for the total population of Michigan from chronic

Table 2.28
Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	1	-	1	-	-	-	1	-	1	-	-	-
1-4	2	1	1	1	-	1	1	1	-	-	-	-
5-9	1	-	1	1	-	1	-	-	-	-	-	-
10-14	5	2	3	3	1	2	2	1	1	-	-	-
15-19	5	4	1	3	3	-	2	1	1	-	-	-
20-24	3	3	-	2	2	-	1	1	-	-	-	-
25-29	5	2	3	4	2	2	1	-	1	-	-	-
30-34	5	3	2	2	-	2	3	3	-	-	-	-
35-39	6	2	4	1	-	1	5	2	3	-	-	-
40-44	8	5	3	6	4	2	2	1	1	-	-	-
45-49	21	11	10	18	8	10	3	3	-	-	-	-
50-54	61	33	28	50	27	23	11	6	5	-	-	-
55-59	141	92	49	125	82	43	16	10	6	-	-	-
60-64	198	123	75	183	117	66	15	6	9	-	-	-
65-69	374	262	112	342	238	104	31	23	8	1	1	-
70-74	375	266	109	348	243	105	27	23	4	-	-	-
75-79	411	297	114	387	279	108	24	18	6	-	-	-
80-84	305	220	85	287	205	82	17	14	3	1	1	-
85-89	188	131	57	173	119	54	15	12	3	-	-	-
90+	88	59	29	85	57	28	3	2	1	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	2203	1516	687	2021	1387	634	180	127	53	2	2	-
Median Age At Last Birthday	73	73	72	73	74	72	69	70	63	*	*	*

Table 2.29
Death Rates for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Age, Race, and Sex[1], Michigan Residents, 1981

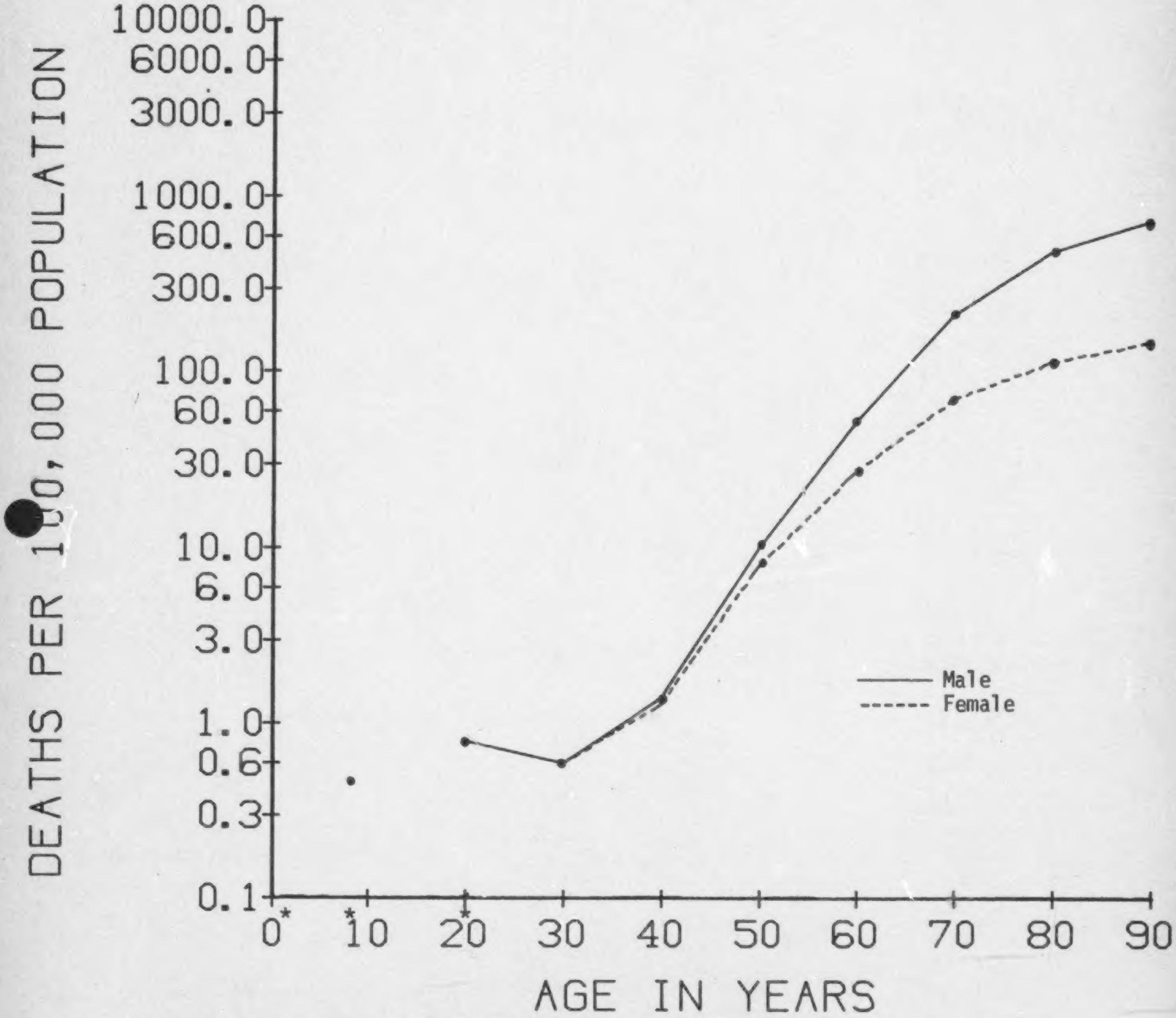
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	23.8	33.6	14.5	25.8	36.2	15.8	12.6	18.6	7.1
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	.4	*	.5	.3	*	*	*	*	*
15-24 Years	.5	.8	*	.3	.7	*	*	*	*
25-34 Years	.6	.6	.6	.5	*	*	*	*	*
35-44 Years	1.3	1.4	1.3	.8	*	*	4.8	*	*
45-54 Years	9.0	10.0	8.1	8.6	9.0	8.2	11.8	16.5	7.8
55-64 Years	38.8	51.9	27.0	39.9	54.2	26.9	30.7	33.8	28.1
65-74 Years	132.3	211.9	69.7	137.0	217.2	74.0	94.0	168.2	34.9
75-84 Years	254.0	485.3	113.5	264.1	506.7	118.9	155.9	295.8	58.2
85 Years and Over	325.3	722.6	146.9	329.1	728.7	151.2	279.7	654.2	*
Age-Adjusted Rate[2]	16.3	26.4	9.3	16.6	27.0	9.5	13.2	21.2	7.3

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

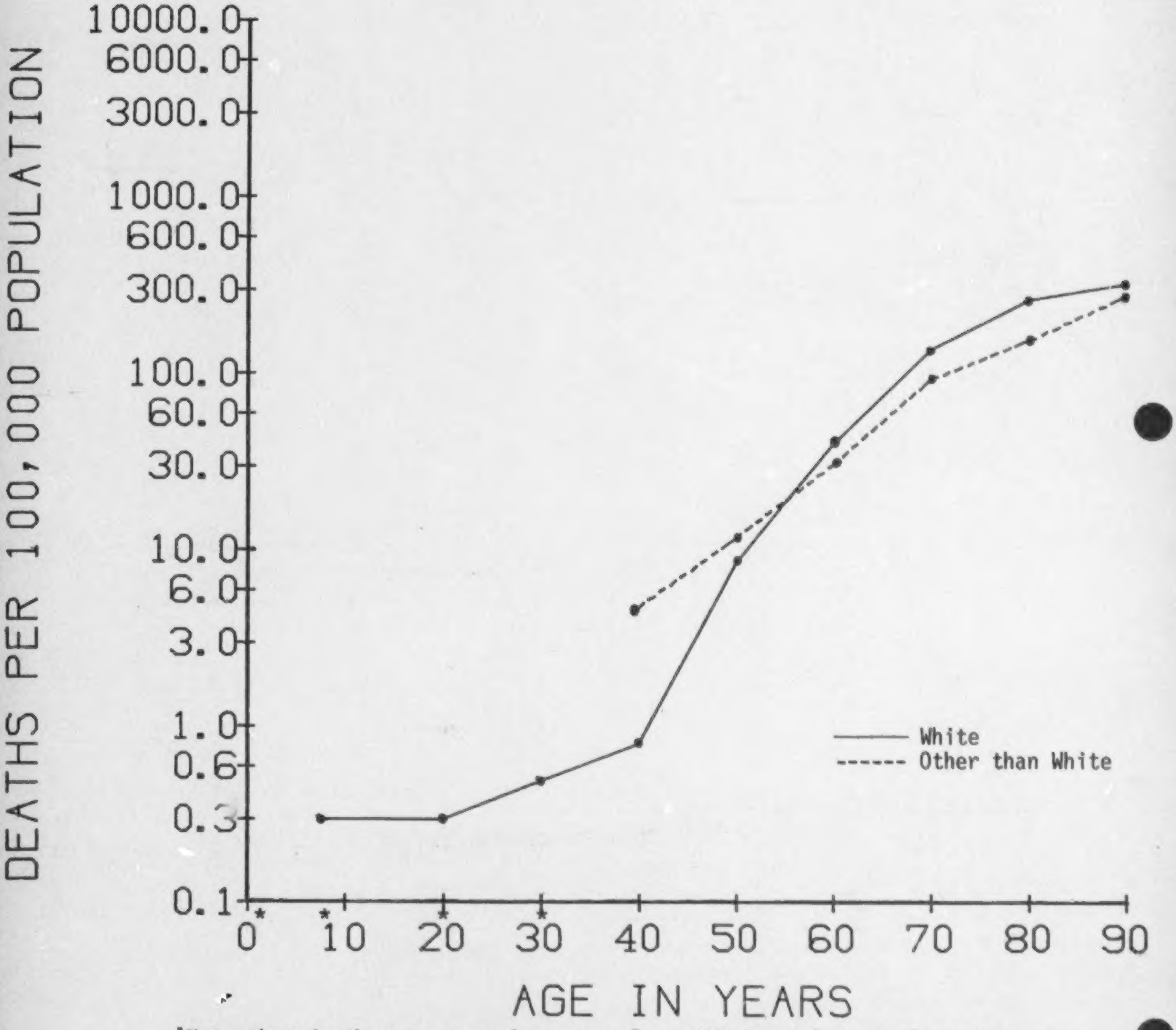
FIGURE 2.26 AGE-SPECIFIC DEATH RATES[1] FOR DEATHS DUE TO CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS, BY SEX, MICHIGAN RESIDENTS, 1981



[1]Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.27 AGE-SPECIFIC DEATH RATES[1] FOR DEATHS DUE TO CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS, BY RACE, MICHIGAN RESIDENTS, 1981



[1]Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

Table 2.30
Age-Adjusted Death Rates[1] for Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions[2] by Race and Sex, Michigan Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	14.2	24.9	5.6	14.3	25.3	5.4	12.3	18.5	6.7
	1971	13.9	24.4	5.6	13.8	24.5	5.4	13.8	22.0	6.5
	1972	14.9	26.5	5.7	15.2	27.2	5.8	11.0	19.1	4.2
	1973	15.4	26.7	6.4	15.6	27.3	6.5	12.0	20.2	5.0
	1974	13.8	24.1	5.8	14.2	24.7	6.1	9.4	16.9	3.1
	1975	14.3	25.1	6.1	14.6	25.7	6.2	11.0	18.3	5.0
	1976	14.7	25.4	6.8	15.0	26.0	6.9	11.7	20.2	4.9
	1977	14.1	24.4	6.5	14.5	25.2	6.5	10.5	16.5	5.7
	1978	15.7	26.1	8.2	15.9	26.4	8.4	13.5	22.8	6.1
	1979	15.2	26.1	7.4	15.5	26.7	7.6	12.2	20.7	5.6
	1980	15.7	25.5	8.9	16.0	25.8	9.2	12.7	21.5	5.7
	1981	16.3	26.4	9.3	16.6	27.0	9.5	13.2	21.2	7.3

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Categories used for 1970-1978 are 8th Revision ICDA codes 490-493 (bronchitis, emphysema, and asthma) and *519.3 (chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema). For years since 1979 9th Revision ICD codes 490-496 are used. No single comparability ratio was developed for the 9th Revision category and the most nearly comparable 8th Revision categories. However, for the combined categories of bronchitis, emphysema, and asthma the provisional comparability ratio is 1.0002, and that for the remaining titles (chronic obstructive lung disease without mention of asthma, bronchitis, or emphysema under the 8th Revision and other chronic obstructive pulmonary diseases and allied conditions under the 9th Revision) is 1.0054. Thus, the comparability between the composite categories is quite good. The composite category was not used for ranking causes of death under the 8th Revision and thus appeared in 1979 for the first time among the 10 leading causes of death.

obstructive pulmonary diseases and allied conditions was 15.7 in 1980. This is 3.1 percent below the provisional United States age-adjusted rate of 16.2 in 1980 (see Technical Notes).

Of the 2,203 Michigan resident deaths due to chronic obstructive pulmonary diseases and allied conditions, 1,420 (64.5 percent) were classified as chronic airways obstruction, not elsewhere classified. There were 521 deaths in 1981 due to emphysema, 126 due to bronchitis, and 110 due to asthma (Table 2.31).

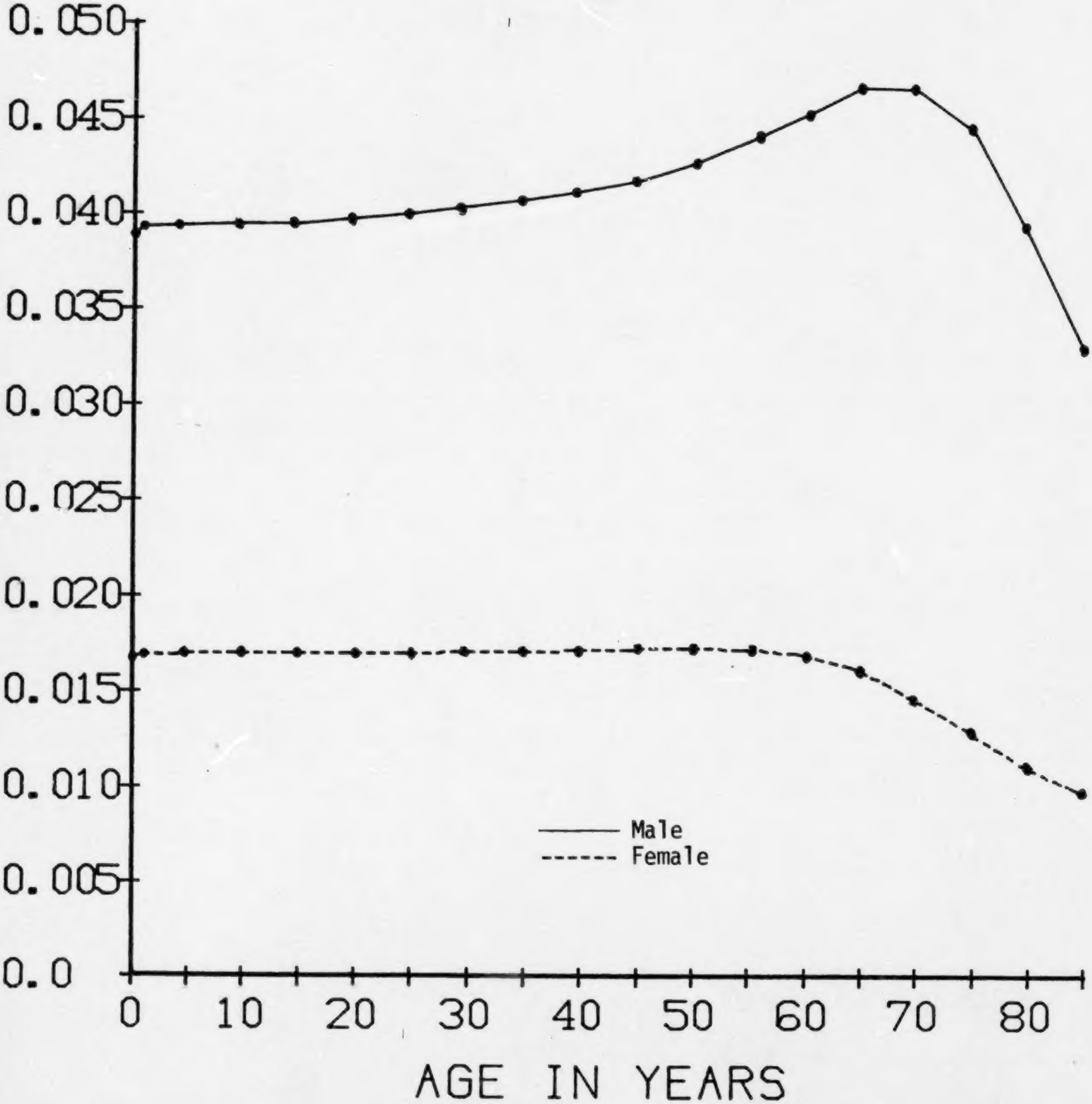
Based on mortality data from 1979-1981, the probability of eventual death due to chronic obstructive pulmonary diseases and allied conditions is 0.039 for males and 0.017 for females at birth. The probability for males increases steadily to a peak of 0.047 at age 65 and then declines in the last few age groups. The probability for females remains stable from birth through age 60 and then declines in the oldest age groups (Figure 2.28). Between ages 60 and 85 the probability for females declines by 43 percent to 0.010. It should be recalled that these probability estimates are based on mortality data which have been changing rapidly, in part due to changing diagnostic conventions.

Table 2.31
Deaths Due to Chronic Obstructive Pulmonary Diseases and Allied Conditions by Specific Cause, Michigan Residents, 1981

282 LIST' NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
174	Chronic Airways Obstruction, not elsewhere classified	1,420	64.5
171	Emphysema	521	23.6
170	Chronic Bronchitis	110	5.0
172	Asthma	110	5.0
173	Bronchiectasis and Extrinsic Allergic Alveolitis . .	26	1.2
169	Bronchitis, not Specified as Acute or Chronic	16	0.7
	Total	2,203	100.0

'List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.28 PROBABILITY OF EVENTUALLY DYING FROM CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND ALLIED CONDITIONS, BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

PNEUMONIA AND INFLUENZA

One of every 44 deaths that occurred to Michigan residents in 1981 was due to pneumonia and influenza. There were a total of 1,716 such deaths of which 913 (53.2 percent) were to males.

The overall median age at death in 1981 for those dying from pneumonia and influenza was 80 years (Table 2.32). This is well above the median age of 72 years for all deaths. The median ages at death for white persons were significantly higher than those for other than white persons. The median age for white males (79) was 10 years greater than that for other than white males (69), while for white females the median of 84 years exceeded by 12 years that for other than white females. For persons of all races the median for males was 5 years less than that for females.

The overall crude death rate for pneumonia and influenza deaths in 1981 was 18.5, compared to a rate of 19.5 in 1980. The crude rate of 20.2 for males was 20 percent higher than the rate of 16.9 for females. On an age-adjusted basis, this differential increased significantly. The age-adjusted rate for males exceeded that for females by 89 percent (Table 2.33).

The age-specific death rates for males and females given in Table 2.33 are graphically displayed in Figure 2.29. Note the high pneumonia and influenza death rates for both sexes under 1 year of age. Pneumonia and influenza death rates increased rapidly beyond age 54 with rates for males significantly higher than for females.

The crude rates given in Table 2.33 indicate that a greater proportion of the white population died of pneumonia and influenza in 1981 than was the case for the other than white population. On an age-adjusted basis, however, the rate for the other than white group was 74 percent above that for the white group. Age-specific data indicate that the rates for the other than white population were higher from birth to age 85. Among persons 85 years or over, the pneumonia and influenza death rate was higher for white persons (Figure 2.30).

Pneumonia and influenza death rates have declined markedly since 1900 both nationally and in Michigan (Figure 2.31). The annual rate was quite erratic from 1900 through 1940 or 1945. Since that time the rate has been fairly stable in terms of year to year variation while the general trend has remained downward. Michigan's rate of death due to this cause has been below the national rate almost without exception throughout this century. In 1900, the rate in Michigan was 120.3 while the national statistic was 202.1. The peak year for both was 1918 when the rates for

Table 2.32
Deaths Due to Pneumonia and Influenza by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	16	7	9	11	4	7	5	3	2	-	-	-
1-4	5	3	2	3	1	2	2	2	-	-	-	-
5-9	5	3	2	3	1	2	2	2	-	-	-	-
10-14	3	1	2	2	1	1	1	-	1	-	-	-
15-19	1	-	1	1	-	1	-	-	-	-	-	-
20-24	8	7	1	4	3	1	4	4	-	-	-	-
25-29	9	5	4	4	3	1	5	2	3	-	-	-
30-34	11	7	4	7	5	2	4	2	2	-	-	-
35-39	21	11	10	11	6	5	10	5	5	-	-	-
40-44	16	10	6	11	6	5	5	4	1	-	-	-
45-49	18	13	5	12	7	5	6	6	-	-	-	-
50-54	35	21	14	22	11	11	13	10	3	-	-	-
55-59	67	45	22	40	27	13	27	18	9	-	-	-
60-64	78	48	30	63	40	23	15	8	7	-	-	-
65-69	105	70	35	83	57	26	22	13	9	-	-	-
70-74	148	96	52	122	76	46	26	20	6	-	-	-
75-79	263	146	117	236	134	102	26	12	14	1	-	1
80-84	315	165	150	279	140	139	36	25	11	-	-	-
85-89	306	134	172	292	126	166	13	7	6	1	1	-
90+	286	121	165	270	115	155	16	6	10	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1716	913	803	1476	763	713	238	149	89	2	1	1
Median Age At Last Birthday	80	78	83	82	79	84	69	69	72	*	*	*

Table 2.33
Pneumonia and Influenza Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

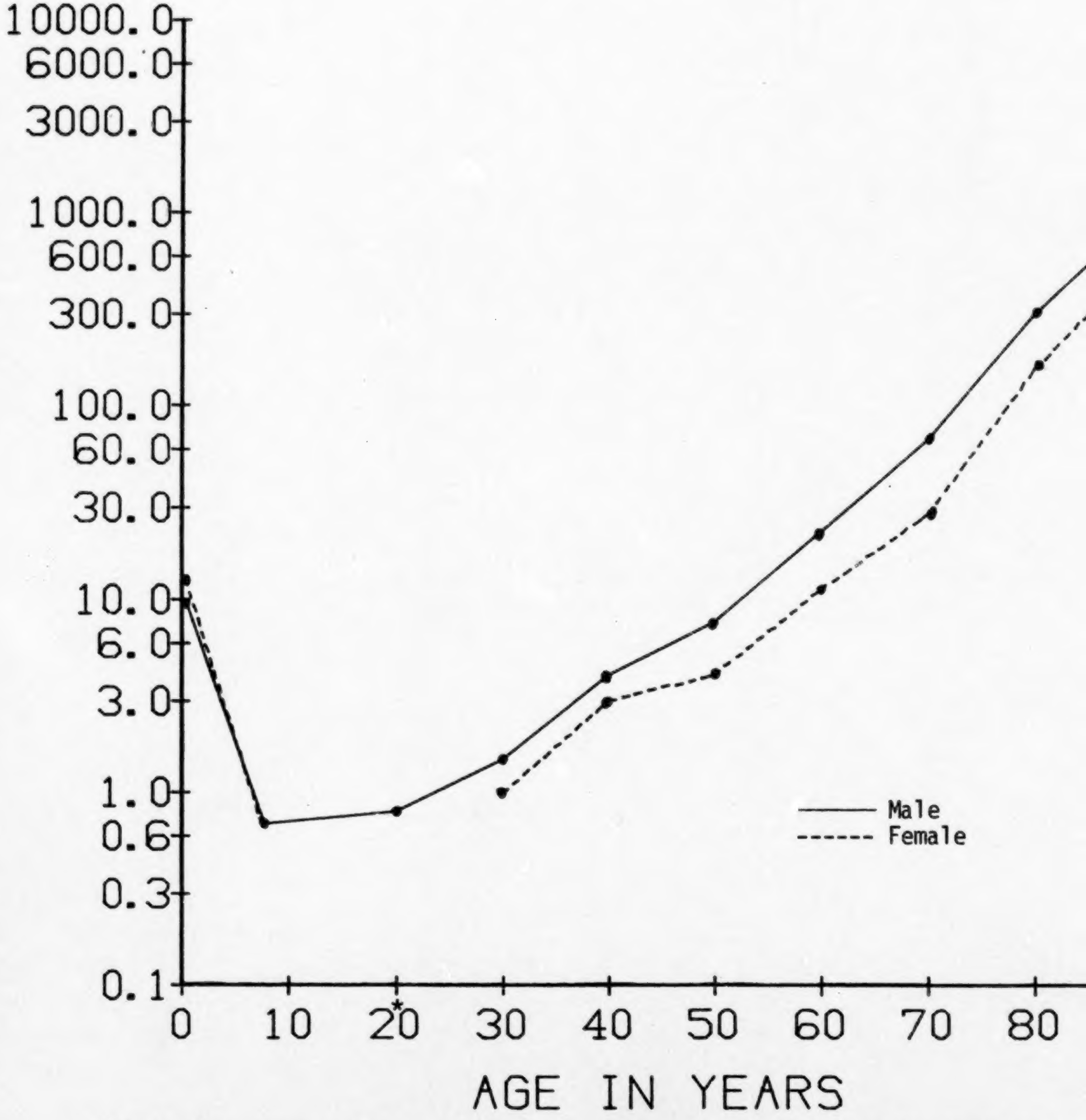
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	18.5	20.2	16.9	18.8	19.9	17.8	16.7	21.9	11.9
Under 1 Year	11.4	9.8	13.0	9.8	*	12.7	17.8	*	*
1-14 Years	.6	.7	.6	.5	*	.6	1.2	*	*
15-24 Years	.5	.8	*	.3	*	*	*	*	*
25-34 Years	1.3	1.5	1.0	.8	1.2	*	3.5	*	3.7
35-44 Years	3.5	4.1	3.0	2.4	2.7	2.2	10.2	13.1	7.6
45-54 Years	5.8	7.7	4.1	4.3	4.6	4.0	16.0	29.4	*
55-64 Years	16.6	22.5	11.3	13.3	18.3	8.9	41.7	54.9	29.9
65-74 Years	44.7	66.6	27.5	40.6	59.9	25.5	77.8	120.7	43.7
75-84 Years	205.1	291.9	152.3	201.9	286.3	151.4	235.8	342.0	161.6
85 Years and Over	697.8	969.8	575.7	718.1	1001.9	591.8	450.7	607.5	372.5
Age-Adjusted Rate[2]	10.8	14.9	7.9	9.8	13.5	7.4	17.1	25.0	10.9

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

FIGURE 2.29 AGE-SPECIFIC PNEUMONIA AND INFLUENZA DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



[1]Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

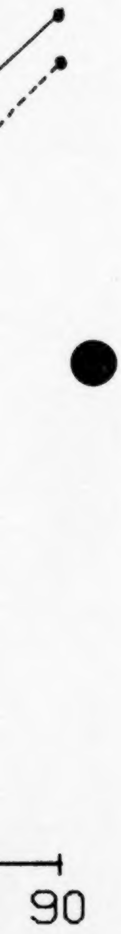
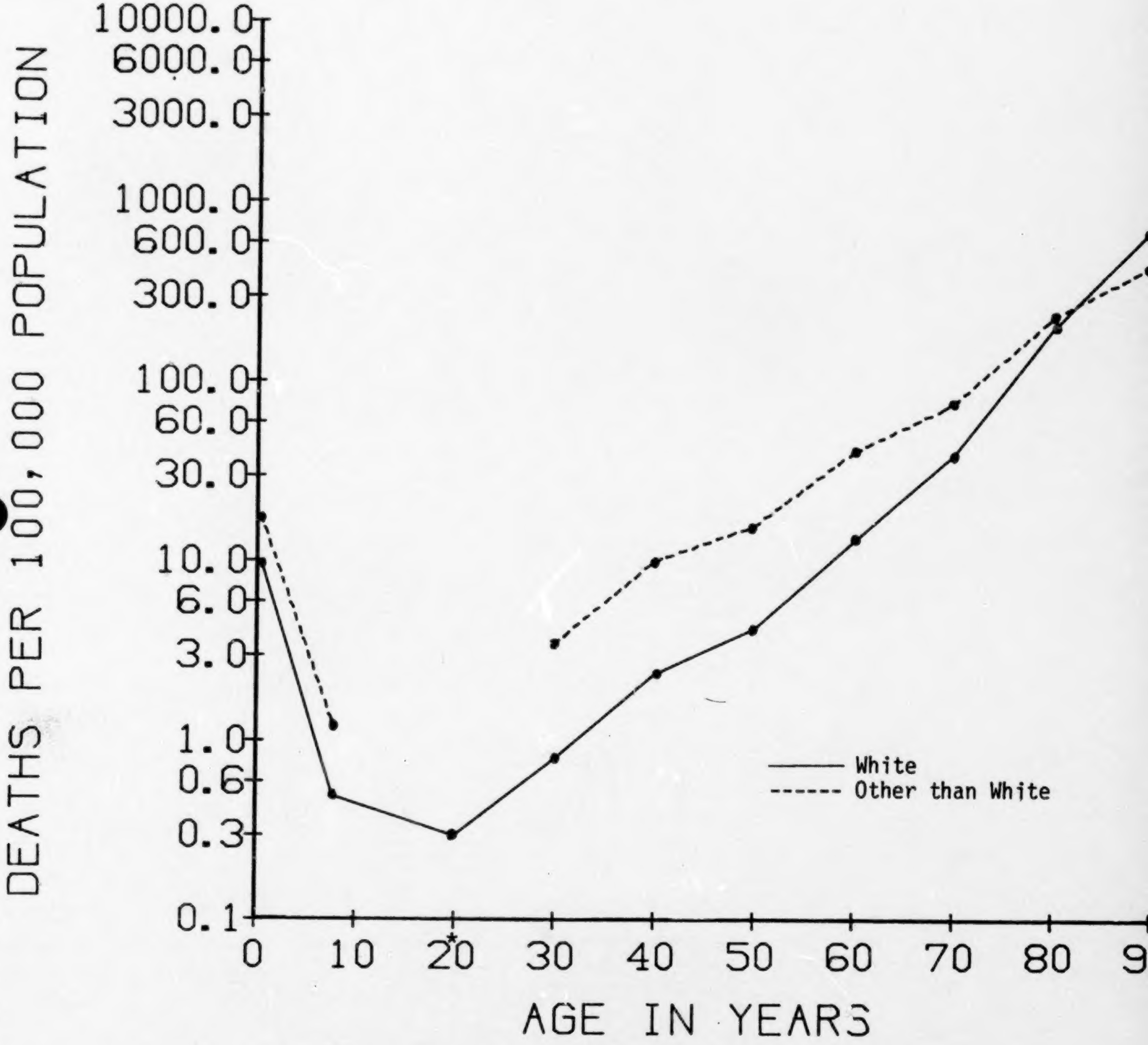


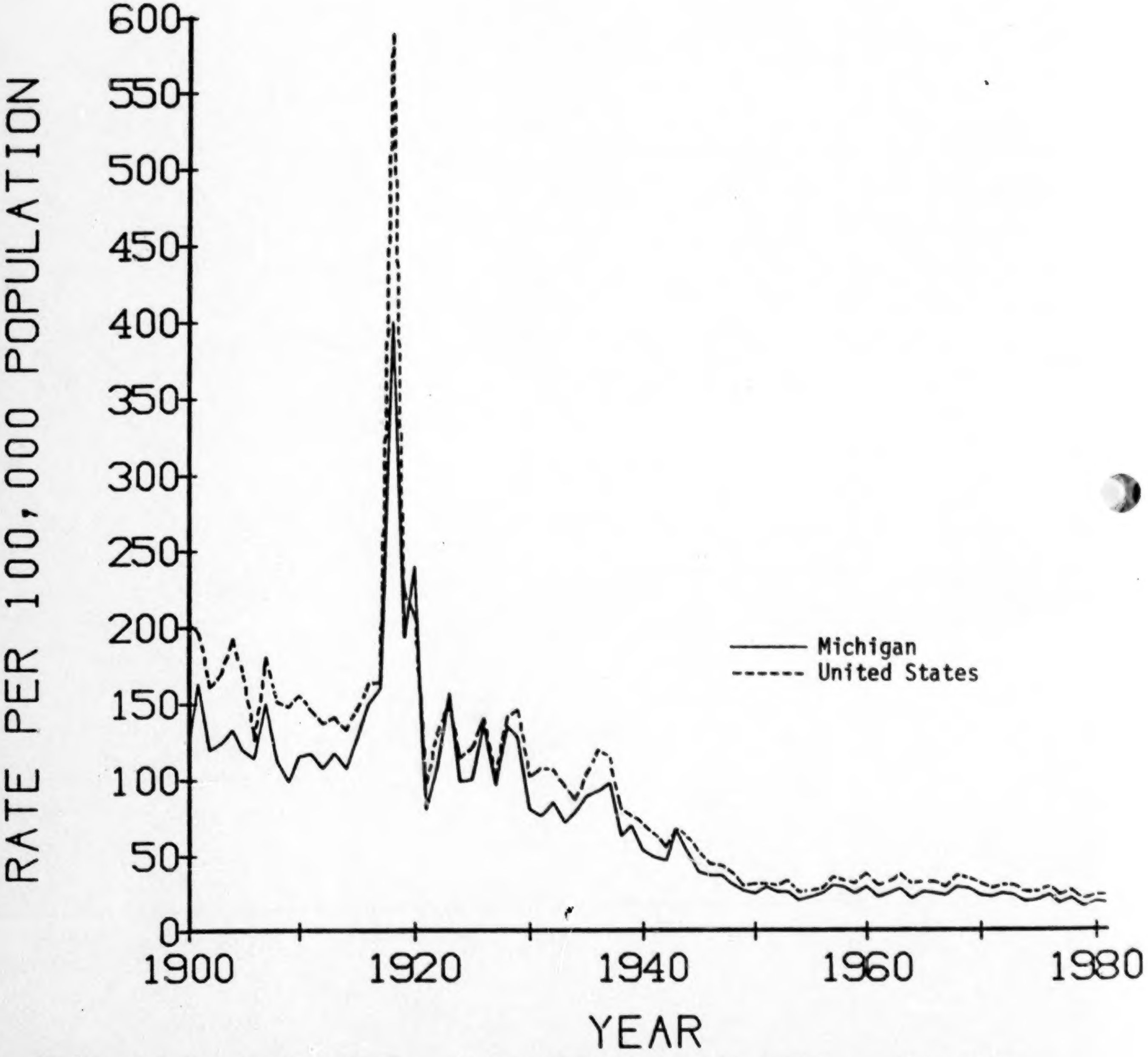
FIGURE 2.30 AGE-SPECIFIC PNEUMONIA AND INFLUENZA DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.31 PNEUMONIA AND INFLUENZA DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS,[1] 1900-1981[2]



[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. U.S. rates for 1980 and 1981 are provisional.

[2] Pneumonia and influenza death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

the United States and Michigan were 588.5 and 399.8, respectively. In 1979 century low rates of 15.9 for Michigan and 20.5 for the nation were recorded. Michigan's rate of 18.5 in 1981 was 22 percent below the provisional rate of 23.7 for the United States.

Michigan's age-adjusted death rate for pneumonia and influenza has been below that for the nation every year since 1970 (Table 2.34). Between 1970 and 1981 the age-adjusted rate for Michigan declined by 44 percent. Rates for other than white persons declined more rapidly than rates for white persons. The decline was most dramatic for other than white females for whom the age-adjusted rate dropped from 30.8 in 1970 to 10.9 in 1981, a decline of 65 percent. The declines in rates for other than white males and females were more pronounced in Michigan than for the United States (see Technical Notes).

The majority of deaths due to pneumonia and influenza were not attributed to a specific organism. Pneumonia due to other (7 deaths) and unspecified (1,262 deaths) organisms accounted for 74.0 percent of all Michigan pneumonia and influenza deaths in 1981 (Table 2.35). Another 12.9 percent of the deaths were due to bronchopneumonia, organism unspecified, and 130 deaths were due to pneumococcal and other bacterial pneumonia (67 and 63 deaths, respectively). The three most frequent categories of pneumonia and influenza deaths together accounted for 94.4 percent of all such deaths. Influenza was directly involved in 4.2 percent of the pneumonia and influenza deaths in 1981, compared to 5.3 percent in 1980 and 1.4 percent in 1979.

The likelihood of eventual death being caused by pneumonia and influenza is between 0.027 and 0.028 for females and between 0.025 and 0.026 for males from birth to age 50. The calculated probabilities for each sex increase after this age, with probabilities for males increasing more rapidly than those for females. Based on the Michigan mortality experience of 1979-1981, by age 85 the chances of eventually dying from pneumonia and influenza are 0.051 for males and 0.041 for females (Figure 2.32).

Table 2.34
Age-Adjusted Pneumonia and Influenza Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981[2]

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	19.2	24.7	14.6	16.7	21.8	12.5	38.8	47.9	30.8
	1971	17.7	23.9	12.7	15.4	20.6	11.3	35.6	50.1	22.9
	1972	18.7	25.7	12.9	16.8	23.1	11.8	32.7	46.6	20.4
	1973	17.0	21.9	13.2	14.9	19.4	11.5	33.8	42.7	26.3
	1974	13.3	17.7	10.0	12.1	15.7	9.5	22.5	33.2	13.5
	1975	14.0	18.6	10.6	13.0	17.2	10.0	21.2	28.7	14.7
	1976	15.7	20.8	12.0	14.8	19.6	11.5	21.5	29.5	14.9
	1977	12.2	17.6	8.2	11.5	16.5	7.8	17.2	25.1	10.7
	1978	14.1	18.1	11.2	13.8	17.7	11.0	15.5	20.1	11.8
	1979	9.6	13.3	7.1	9.0	12.3	6.7	13.9	19.1	9.6
	1980	11.7	16.1	8.6	10.8	14.6	8.2	17.9	27.0	10.7
	1981	10.8	14.9	7.9	9.8	13.5	7.4	17.1	25.0	10.9
U.S.	1970	22.1	28.8	16.7	19.8	26.0	15.0	38.1	50.1	27.9
	1971	19.3	24.9	14.8	17.6	22.7	13.6	32.0	43.0	22.8
	1972	20.8	27.6	15.6	19.2	25.4	14.4	32.6	44.5	22.8
	1973	20.1	26.6	15.2	18.5	24.6	14.0	31.4	42.3	22.5
	1974	16.9	22.6	12.8	15.7	21.0	12.0	25.4	35.1	17.5
	1975	16.6	22.5	12.3	15.6	21.0	11.7	23.9	33.5	16.1
	1976	17.4	23.1	13.2	16.3	21.8	12.6	24.4	33.7	17.0
	1977	14.2	19.4	10.4	13.2	18.1	9.8	21.0	29.6	14.0
	1978	15.4	21.0	11.5	14.5	19.6	10.9	21.8	30.9	14.6
	1979	11.4	15.6	8.4	10.7	14.6	8.0	16.1	22.8	10.8
	1980	12.6[3]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] The introduction in 1979 of the 9th Revision of the International Classification of Diseases, WHO, for coding causes of death resulted in substantial changes in this category, making trend comparisons difficult. The estimated comparability ratio for this category is 0.9264. Note that comparability ratios were developed for comparing crude death rates, and they are not strictly applicable for comparing age-adjusted death rates. For further discussion of comparability ratios see Qualifications and Limitations of Data and Calculations.

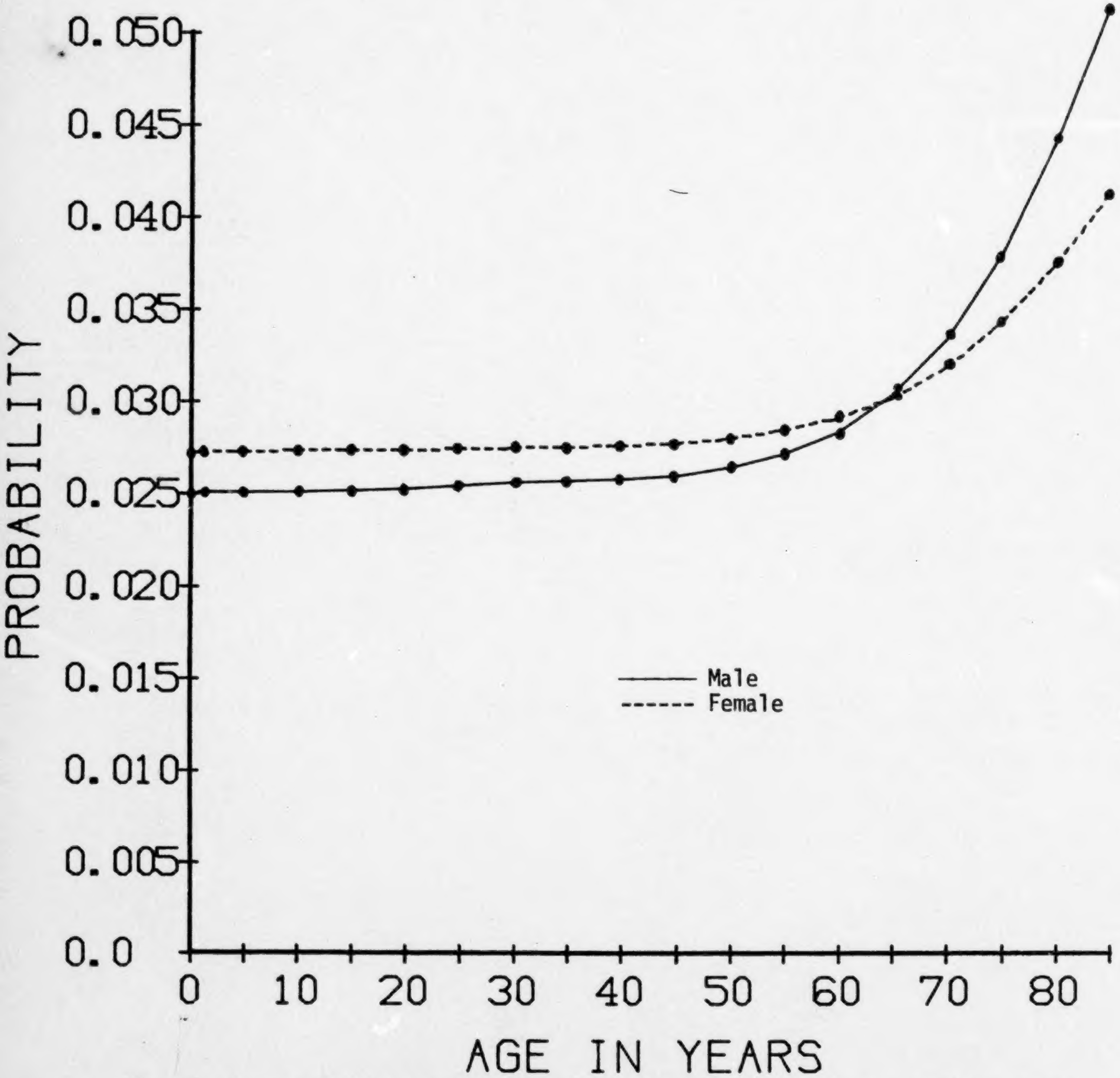
[3] Provisional.

Table 2.35
Deaths Due to Pneumonia and Influenza by Specific Cause, Michigan Residents, 1981

282 LIST' NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
167	Pneumonia due to Other and Unspecified Organism	1,269	74.0
166	Bronchopneumonia, Organism Unspecified	221	12.9
165	Pneumococcal and Other Bacterial Pneumonia . .	130	7.6
168	Influenza	72	4.2
164	Viral Pneumonia	24	1.4
	Total	1,716	100.0

List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.32 PROBABILITY OF EVENTUALLY DYING FROM PNEUMONIA AND INFLUENZA BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

DIABETES MELLITUS

In 1981 diabetes mellitus caused the deaths of 1,487 Michigan residents. This is 20 more deaths than were caused by this disease in 1980. Deaths to females numbered 837 or 56 percent of all diabetes mellitus deaths. There were 650 diabetes mellitus deaths to males in 1981.

The median age at death for persons dying from diabetes mellitus was 73 years (Table 2.36). This is one year above the median age of all deaths. Males dying from this disease had a median age of 71 years, whereas the median for females was 74 years. The median for white males was 72 years compared to 75 years for white females. For other than white males the median was 67 years and that for other than white females 68 years.

Diabetes mellitus death rates by age, race, and sex are presented in Table 2.37. The diabetes mellitus crude death rate was 16.0 in 1981. The crude rate for females was 17.6, about 22 percent higher than the rate of 14.4 for males. When age-adjusted rates are examined, however, this relationship is reversed. The age-adjusted rate of 11.8 for males was 10 percent above that of females (10.7). Age-specific mortality rates for males and females presented in Table 2.37 are graphically displayed in Figure 2.33. Rates for males were similar to or higher than those for females. Rates for both sexes increased steadily with advancing age.

Although the crude diabetes mellitus death rate for white persons was somewhat above that of other than white persons (16.3 compared to 14.8), the age-adjusted rate for the other than white population was 52 percent higher than that for the white population. The age-adjusted rate for other than white females was 70 percent above that of their white counterparts, while the age-adjusted rate for other than white males was 35 percent above that of white males. Age-specific rates for other than white persons were higher than those for white persons in all age groups below age 85 with a sufficient number of events to calculate rates (Figure 2.34). The greatest relative differential occurred for ages 45 through 54, where the rate for other than white persons was 2.4 times the rate for white persons.

Diabetes mellitus death rates in Michigan rose steadily from a low of 9.3 in 1900 to a peak of 29.7 in 1949 (Figure 2.35). Adoption of the 6th revision of the International Classification of Diseases in 1950 caused a significant change in Michigan diabetes death rates. From 22.6 in 1950 the rate dipped somewhat then rose to a peak of 27.0 in 1966. Since then the rate has declined 41 percent to 16.0 in 1981. The lowest rate since the 6th revision of the ICD was adopted in 1950 was the rate of 15.7 in 1979. In 1980 the rate increased slightly to 15.8. The increases in 1980

Table 2.36
Deaths Due to Diabetes Mellitus by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	2	1	1	-	-	-	2	1	1	-	-	-
15-19	1	-	1	1	-	1	-	-	-	-	-	-
20-24	8	2	6	4	-	4	4	2	2	-	-	-
25-29	11	6	5	10	6	4	1	-	1	-	-	-
30-34	10	6	4	6	4	2	4	2	2	-	-	-
35-39	14	11	3	13	11	2	1	-	1	-	-	-
40-44	21	14	7	17	12	5	4	2	2	-	-	-
45-49	25	16	9	17	11	6	8	5	3	-	-	-
50-54	70	30	40	53	22	31	17	8	9	-	-	-
55-59	97	51	46	80	46	34	16	4	12	1	1	-
60-64	148	75	73	119	62	57	29	13	16	-	-	-
65-69	183	79	104	146	60	86	37	19	18	-	-	-
70-74	214	94	120	180	82	98	33	11	22	1	1	-
75-79	243	97	146	216	86	130	27	11	16	-	-	-
80-84	197	79	118	181	74	107	15	5	10	1	-	1
85-89	160	52	108	152	50	102	8	2	6	-	-	-
90+	83	37	46	78	34	44	5	3	2	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1487	650	837	1273	560	713	211	88	123	3	2	1
Median Age At Last Birthday	73	71	74	74	72	75	67	67	68	*	*	*

Table 2.37
Diabetes Mellitus Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

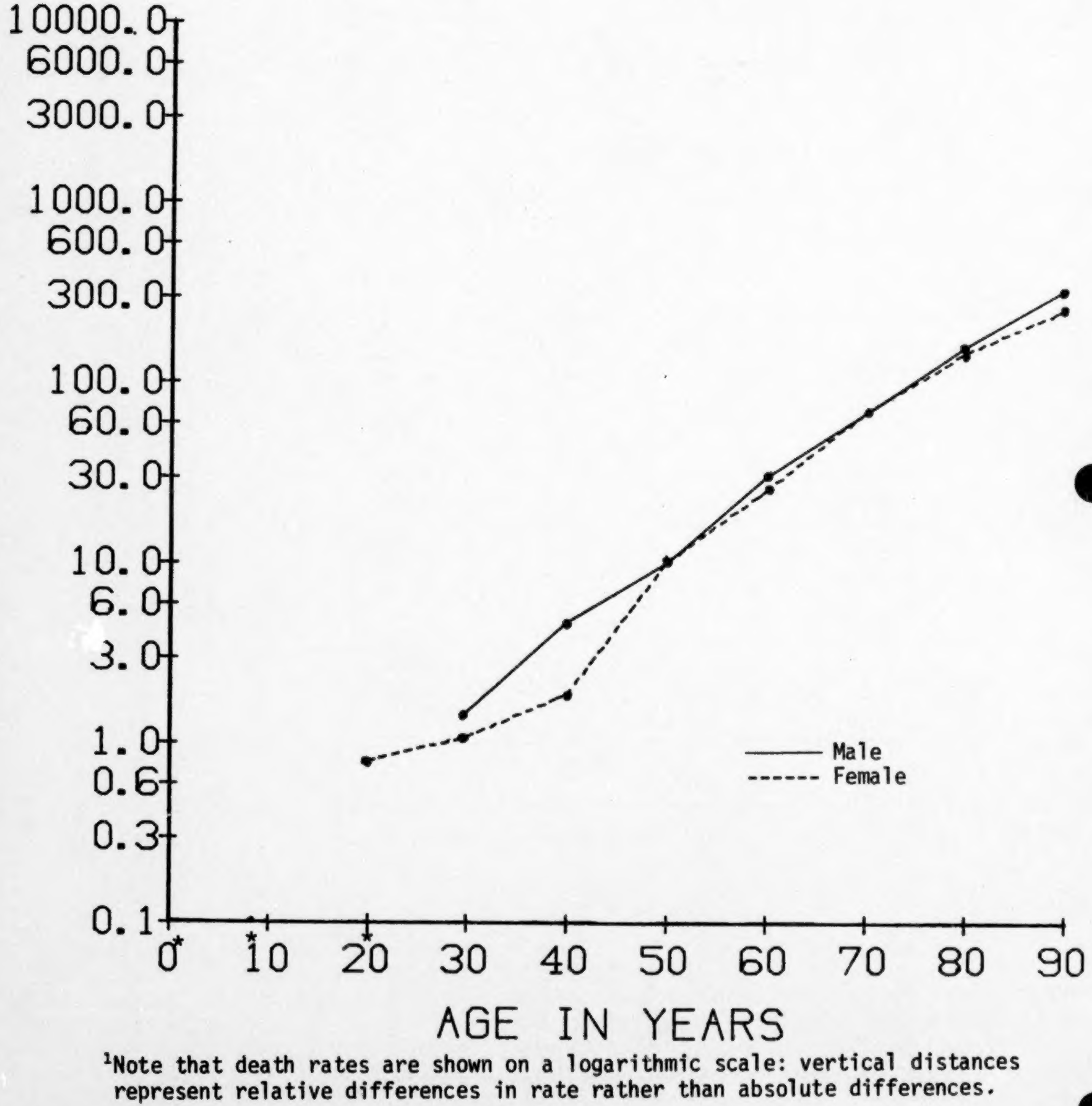
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	16.0	14.4	17.6	16.3	14.7	17.8	14.8	12.9	16.5
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	*	*	*	*	*	*	*	*	*
15-24 Years	.5	*	.8	.3	*	.7	*	*	*
25-34 Years	1.3	1.5	1.1	1.2	1.5	.9	2.0	*	*
35-44 Years	3.3	4.8	1.9	3.3	5.1	1.5	3.4	*	*
45-54 Years	10.4	10.4	10.5	8.8	8.5	9.1	21.1	23.9	18.8
55-64 Years	28.1	30.4	25.9	25.9	29.7	22.4	44.6	35.9	52.4
65-74 Years	70.1	69.4	70.7	64.8	64.5	65.1	113.5	109.7	116.5
75-84 Years	156.1	165.2	150.6	155.7	167.2	148.9	159.8	147.9	168.0
85 Years and Over	286.4	338.5	263.1	293.4	347.8	269.1	202.0	233.6	186.3
Age-Adjusted Rate[2]	11.1	11.8	10.7	10.5	11.3	9.8	16.0	15.2	16.7

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

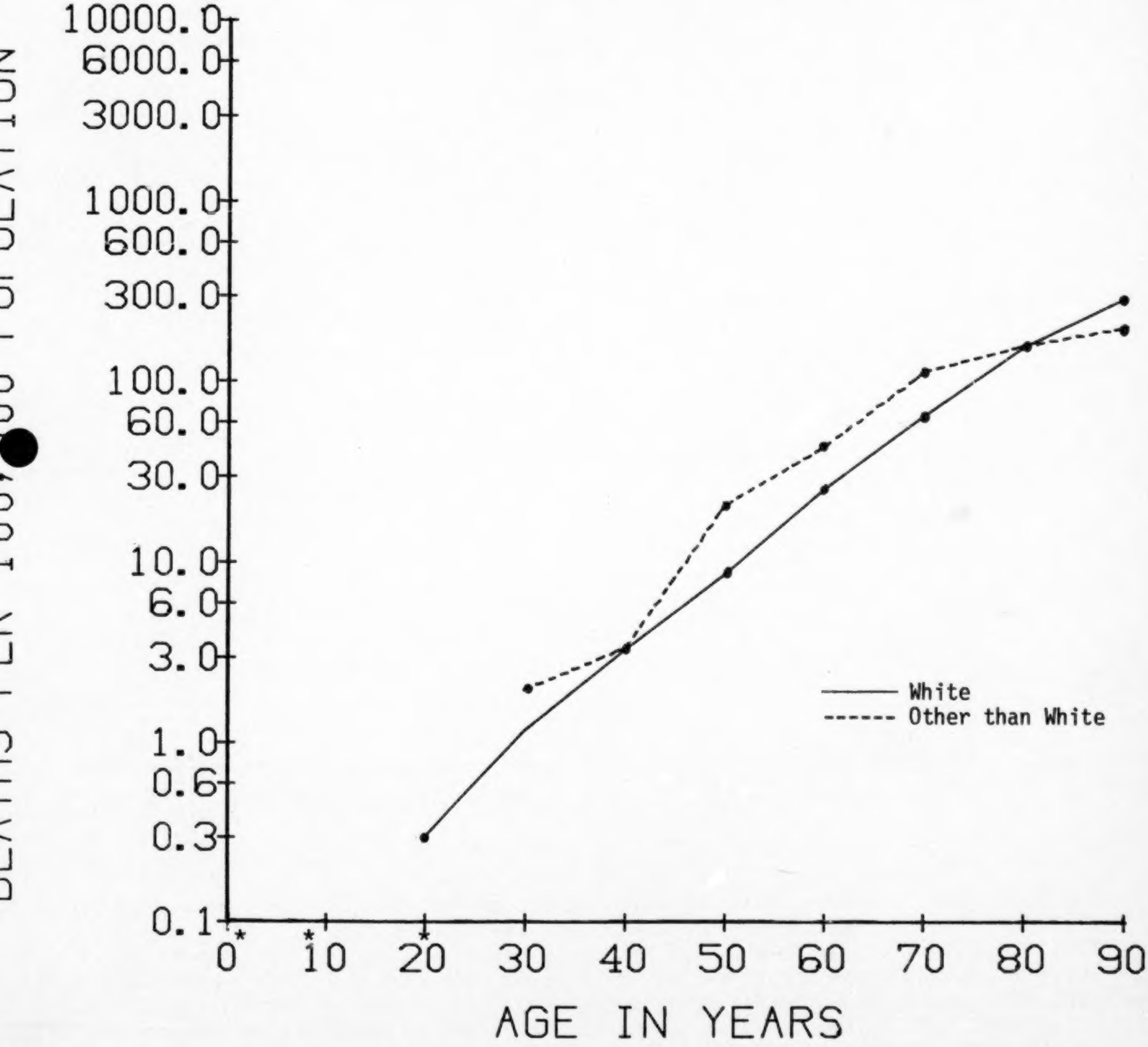
FIGURE 2.33 AGE-SPECIFIC DIABETES MELLITUS DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

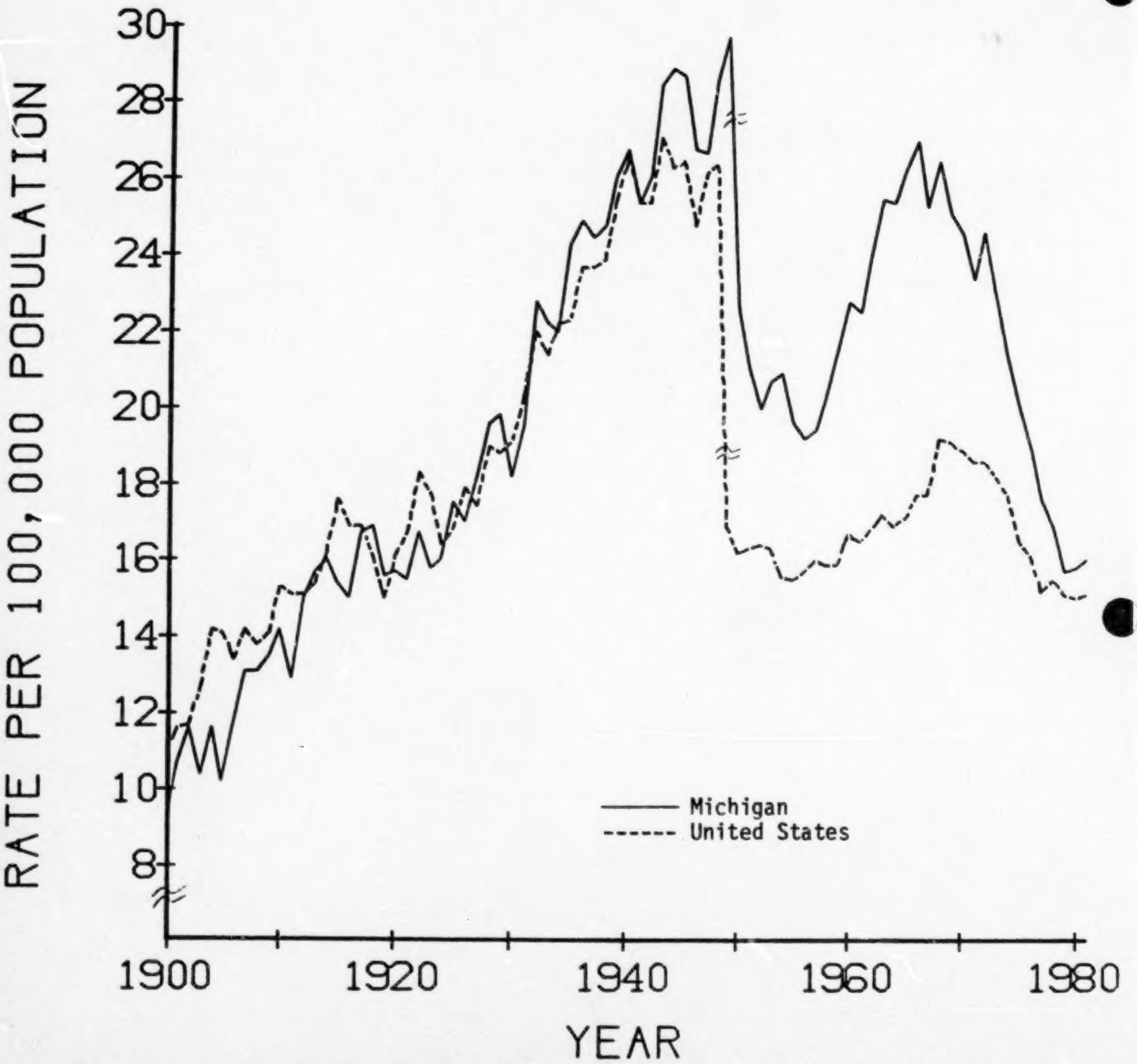
FIGURE 2.34 AGE-SPECIFIC DIABETES MELLITUS DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.35 DIABETES MELLITUS DEATH RATES, MICHIGAN AND UNITED STATES[1]
1900-1981[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. U.S. rates for 1980 and 1981 are provisional.

[2] The comparability of diabetes mellitus death rates from the 5th revision of the ICDA codin procedures with those of the 6th revision is considered weak. The comparability ratio is estimated to be .55. The 6th revision was adopted in 1949 for national cause-of-death statistics and in 1950 for Michigan statistics. The comparability of diabetes mellitus death rates through the 6th, 7th, 8th, and 9th revisions (1949 to date nationally and 1950 to date in Michigan) is high. General comparison before and after these dates of adoption can be made but detailed study requires special consideration. See Technical Notes.

and 1981 follow seven consecutive annual declines in the diabetes mellitus death rate.

The national range in diabetes mellitus death rates in the first half of this century was from 11.0 in 1900 to 27.1 in 1943. The rate for the nation since 1949, though more stable than Michigan's rate, has tended to follow the same pattern. A peak of 19.2 was reached in 1968. Since that time the rate for the nation has declined by 21 percent to a provisional 15.2 in 1981.

The diabetes mellitus death rate for the nation was generally above Michigan's rate for the first 25 or so years in this century. Since 1942, Michigan's rate has been above that of the nation. Through the 1960's the differential between the rates for Michigan and the United States was quite large. This has only recently started to diminish. In 1981 Michigan's rate (16.0) was 5.3 percent above the provisional rate of 15.2 for the United States.

Age-adjusted death rates for diabetes mellitus for the years 1970-1981 are presented in Table 2.38. These rates have generally declined both in Michigan and the United States for all population groups. The rate for the total population of Michigan has declined by 45 percent since 1970, and has fallen or remained the same each year since 1972. The rate for the U.S. declined by 28 percent between 1970 and 1980 (see Technical Notes). In Michigan, rates for other than white persons experienced a greater absolute and relative decline than those for white persons. In 1970 the age-adjusted rate for other than white males was 46 percent above that for white males. In 1981 the differential was 35 percent. In 1970 the rate for other than white females was over twice that of white females. This differential was still 70 percent in 1981.

The declines in the age-adjusted rates for other than white persons were much greater in Michigan than those observed for these groups nationally. Michigan's rates for other than white persons were substantially higher than comparable rates for the nation in 1970, but were lower than those for the nation in 1979. Age-adjusted rates for white persons in Michigan also declined more sharply than comparable rates for the nation. However, they remained higher than those of the nation throughout the period.

In 1981 76.1 percent of all diabetes mellitus deaths were without mention of complication. Diabetes with peripheral circulatory disorders caused 105 deaths, while diabetes with renal manifestations resulted in an additional 93 deaths. There were 119 deaths in 1981 from diabetes with ketoacidosis or coma. These are deaths where a diabetic crisis was involved (Table 2.39).

Table 2.38
Age-Adjusted Diabetes Mellitus Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	20.2	20.8	19.8	18.8	19.9	17.7	34.3	29.1	39.4
	1971	18.9	17.4	20.1	17.5	16.6	18.1	31.0	23.6	37.5
	1972	19.6	18.7	20.2	18.2	17.7	18.5	31.7	27.2	35.8
	1973	18.0	17.4	18.2	16.7	16.4	16.8	27.9	25.1	30.1
	1974	16.2	16.0	16.3	15.7	15.8	15.6	19.6	17.2	21.7
	1975	14.9	14.8	14.9	14.2	14.3	14.0	20.6	19.3	21.8
	1976	13.8	13.7	13.8	12.8	12.7	12.7	22.1	21.8	22.4
	1977	12.9	13.3	12.5	12.2	12.7	11.6	19.1	18.5	19.7
	1978	12.1	12.3	11.8	11.1	11.8	10.4	20.0	16.1	23.0
	1979	11.2	11.1	11.2	10.8	11.3	10.3	14.2	10.1	17.5
	1980	11.2	11.0	11.3	10.5	10.6	10.4	16.1	13.9	17.9
	1981	11.1	11.8	10.7	10.5	11.3	9.8	16.0	15.2	16.7
U.S.	1970	14.1	13.5	14.4	12.9	12.7	12.8	25.2	20.4	29.3
	1971	13.8	13.2	14.2	12.4	12.4	12.4	27.5	21.7	32.4
	1972	13.6	13.2	13.9	12.2	12.3	12.1	26.0	21.2	30.1
	1973	13.2	12.9	13.3	11.8	12.0	11.6	25.3	21.1	28.6
	1974	12.5	12.2	12.7	11.4	11.5	11.2	23.4	18.8	27.1
	1975	11.6	11.4	11.6	10.4	10.7	10.2	21.7	17.9	24.6
	1976	11.1	10.9	11.1	10.0	10.2	9.7	21.0	17.5	23.7
	1977	10.4	10.5	10.3	9.4	9.8	9.0	19.5	16.3	22.0
	1978	10.4	10.5	10.3	9.4	9.8	9.1	19.0	16.3	21.0
	1979	10.0	10.2	9.8	9.0	9.5	8.6	18.5	16.2	20.3
	1980	10.1[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Provisional.

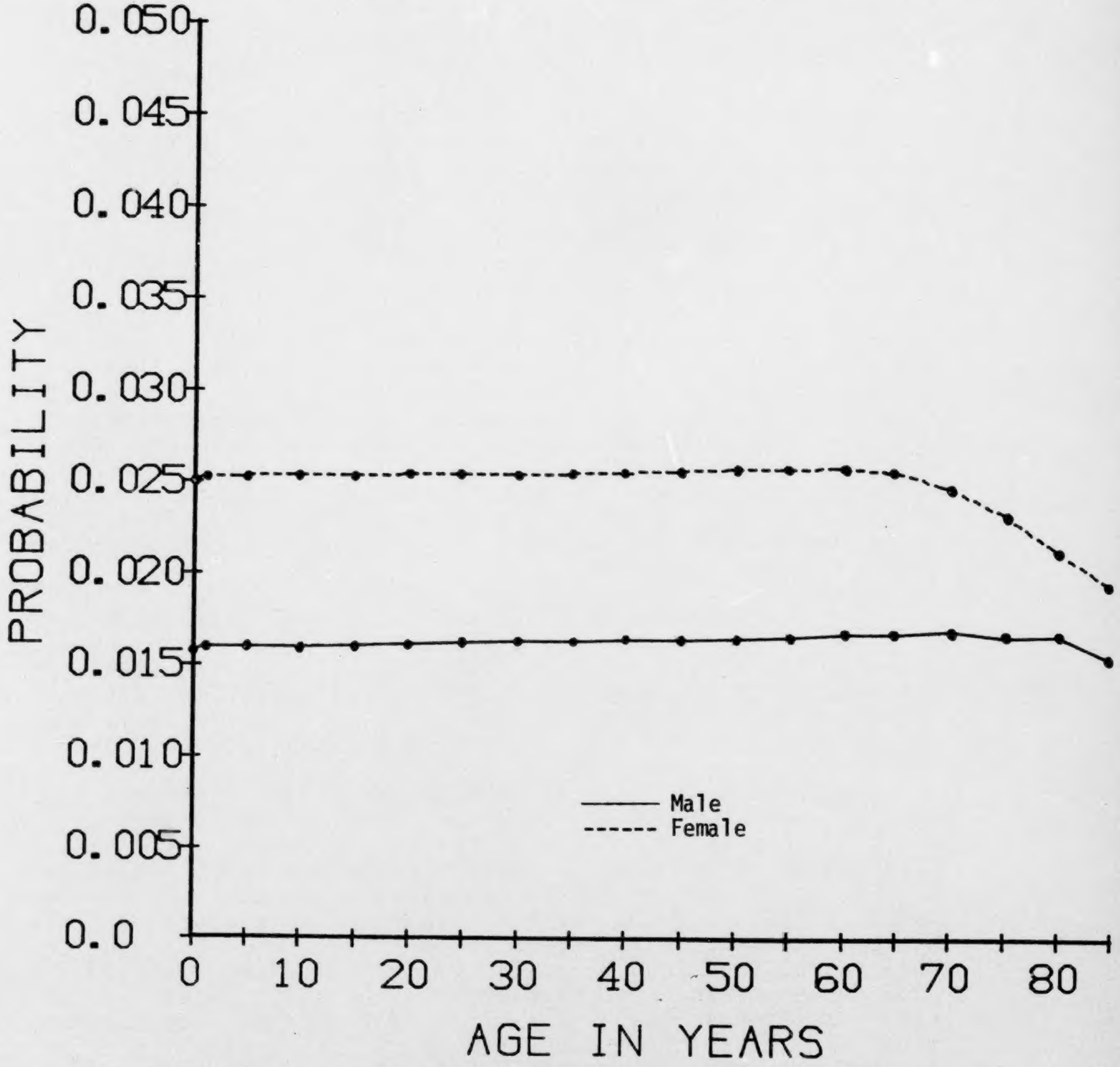
Table 2.39
Deaths Due to Diabetes Mellitus by Detailed Cause, Michigan Residents, 1981

ICD LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
250.0	Diabetes Mellitus without Mention of Complication	1,132	76.1
250.6	Diabetes with Peripheral Circulatory Disorders .	105	7.1
250.3	Diabetes with Renal Manifestations	93	6.3
250.1	Diabetes with Ketoacidosis	68	4.6
250.2	Diabetes with Coma	51	3.4
250.7	Diabetes with Other Specified Manifestations . .	22	1.5
250.5	Diabetes with Neurological Manifestations	13	0.9
250.4	Diabetes with Ophthalmic Manifestations	3	0.2
	Total	1,487	100.0

[1] Detailed List of the 9th Revision of the _International Classification of Diseases_, WHO.

At birth, the probability of eventual death due to diabetes mellitus is 0.016 for males and 0.025 for females (Figure 2.36). The probability of death from diabetes mellitus for females increases slightly from birth to age 60 and declines after that age. Females are less likely to eventually die from this cause at ages 70 and older than when they were born. Probabilities for males are consistently below those for females, and decline less in the older ages. The peak probability for males is 0.017 at age 70.

FIGURE 2.36 PROBABILITY OF EVENTUALLY DYING FROM DIABETES MELLITUS BY AGE AND SEX, MICHIGAN RESIDENTS, 1979 -1981[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

ATHEROSCLEROSIS

There were a total of 1,270 Michigan resident deaths attributed to atherosclerosis in 1981, making this cause the 8th leading cause of death in the state. Atherosclerosis is the term under the 9th Revision (adopted in 1979) for the category most nearly comparable to arteriosclerosis under the 8th Revision. Of the deaths due to this cause in 1981 61.3 percent were to females, while 45.8 percent of all deaths were to females. Only 52 of the 1,270 deaths were to other than white persons. This is 4.1 percent of all atherosclerosis deaths, while 13.4 percent of all deaths were to other than white persons.

The majority of the atherosclerosis deaths were to persons of advanced ages. The median age of all deaths resulting from this disease was 85 years. The median age at death for males was 4 years lower than that for females, and the median for other than white persons was 7 years lower than that for white persons (Table 2.40).

Atherosclerosis resulted in 13.7 deaths per 100,000 Michigan residents in 1981. This represents a 1.5 percent increase from the rate of 13.5 in 1980. Deaths to females from this disease were relatively more frequent than for males with crude mortality rates of 16.4 and 10.9 respectively (Table 2.41). The age-adjusted rate for males, however, was 25 percent higher than that for females. Age-specific atherosclerosis death rates rose sharply beyond age 74 for persons of both sexes. Rates for males were above those for females in all age groups below age 85 with a sufficient number of events to calculate rates (Figure 2.37).

The crude rate for deaths due to atherosclerosis for white persons was 4.3 times that for other than white persons. However, when the differing age distributions of the two groups are considered, the differential is greatly reduced. The age-adjusted rate of 6.6 for whites is double the rate of 3.3 for other than white persons (Figure 2.38).

Inspection of arteriosclerosis death rates since 1900 is far less informative than study of the historical data for other causes of death. The classification of this disease has been significantly altered several times since the inception of the ICD codes (see footnote of Figure 2.39). What can be seen in Figure 2.39 is a strong rise between 1900 and 1912. Rates in Michigan and the nation then stabilized and began declining. A coding revision in 1930 then breaks comparability with 1929 rates. The arteriosclerosis death rates from 1930 through 1948 show no clear direction. From 1950 through 1967 the rates for the nation held fairly stable while in Michigan the rates dropped and then returned to national levels. From 1968

Table 2.40
Deaths Due to Atherosclerosis by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	-	-	-	-	-	-	-	-	-	-	-	-
15-19	-	-	-	-	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-
40-44	3	2	1	3	2	1	-	-	-	-	-	-
45-49	1	-	1	1	-	1	-	-	-	-	-	-
50-54	2	2	-	1	1	-	1	1	-	-	-	-
55-59	11	5	6	8	4	4	3	1	2	-	-	-
60-64	20	14	6	19	13	6	1	1	-	-	-	-
65-69	43	25	18	37	21	16	6	4	2	-	-	-
70-74	101	48	53	90	45	45	10	2	8	1	1	-
75-79	159	79	80	152	74	78	7	5	2	-	-	-
80-84	247	107	140	243	105	138	4	2	2	-	-	-
85-89	320	104	216	308	98	210	12	6	6	-	-	-
90+	363	106	257	355	104	251	8	2	6	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1270	492	778	1217	467	750	52	24	28	1	1	-
Median Age At Last Birthday	85	83	87	85	83	87	78	*	78	*	*	*

Table 2.41
Atherosclerosis Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

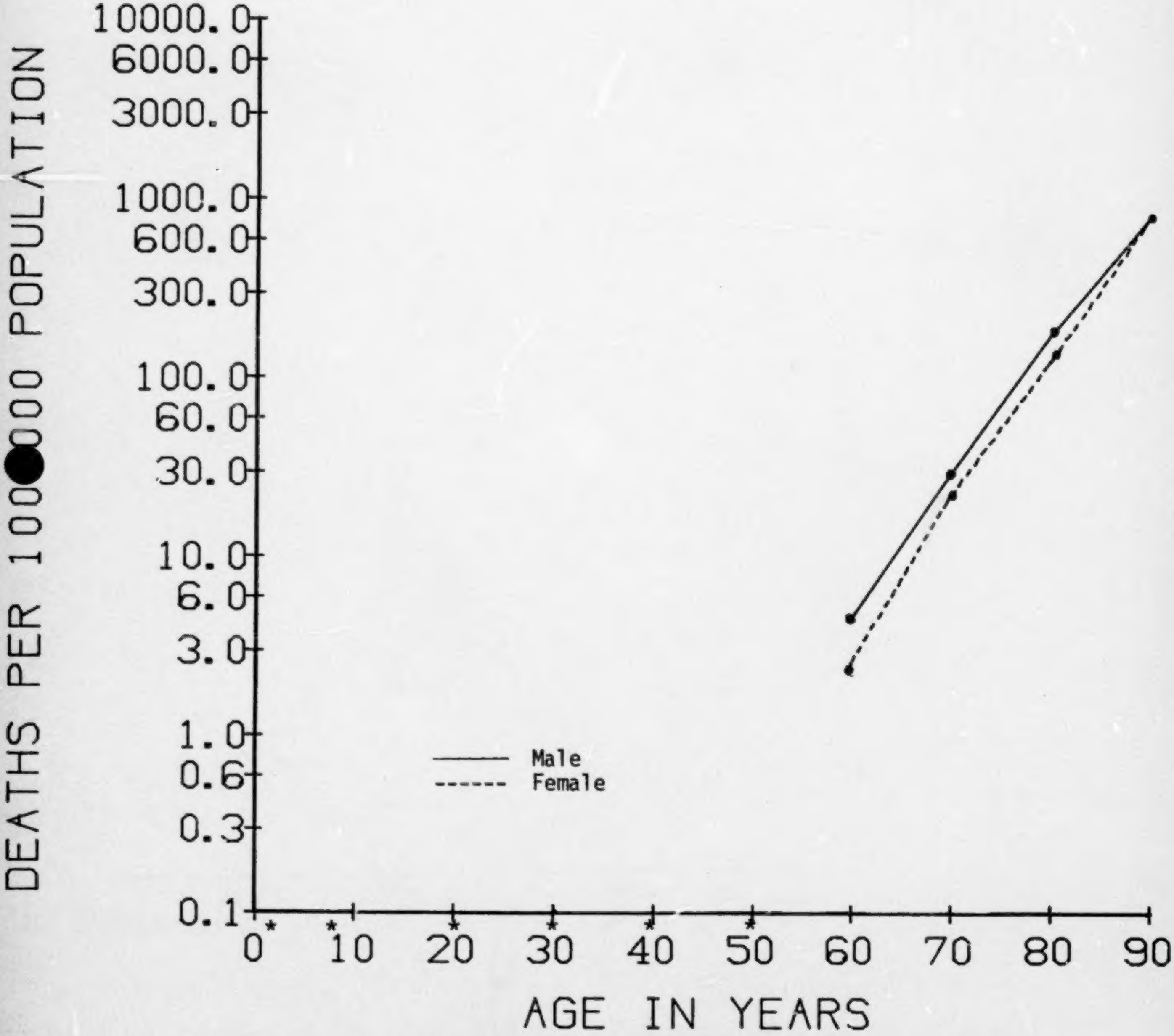
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	13.7	10.9	16.4	15.5	12.2	18.7	3.6	3.5	3.8
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	*	*	*	*	*	*	*	*	*
15-24 Years	*	*	*	*	*	*	*	*	*
25-34 Years	*	*	*	*	*	*	*	*	*
35-44 Years	*	*	*	*	*	*	*	*	*
45-54 Years	*	*	*	*	*	*	*	*	*
55-64 Years	3.5	4.6	2.6	3.5	4.6	2.5	*	*	*
65-74 Years	25.4	29.3	22.4	25.4	30.2	21.6	25.9	21.9	29.1
75-84 Years	144.0	174.6	125.5	154.6	187.0	135.1	41.8	64.7	*
85 Years and Over	805.1	798.7	808.0	845.7	836.3	849.8	310.8	373.8	279.4
Age-Adjusted Rate[2]	6.3	7.1	5.7	6.6	7.5	6.0	3.3	3.8	2.9

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

FIGURE 2.37 AGE-SPECIFIC ATHEROSCLEROSIS DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



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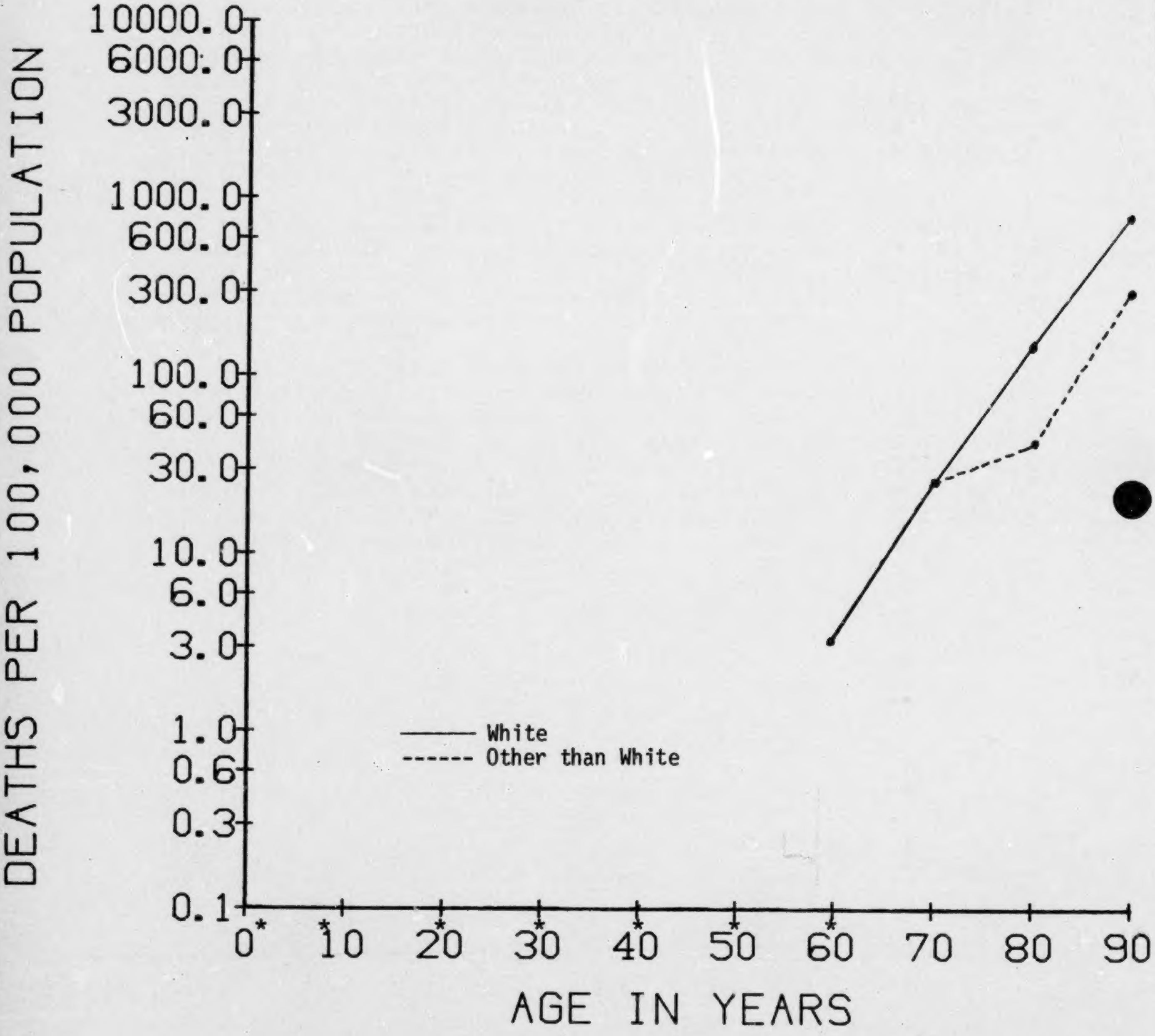
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

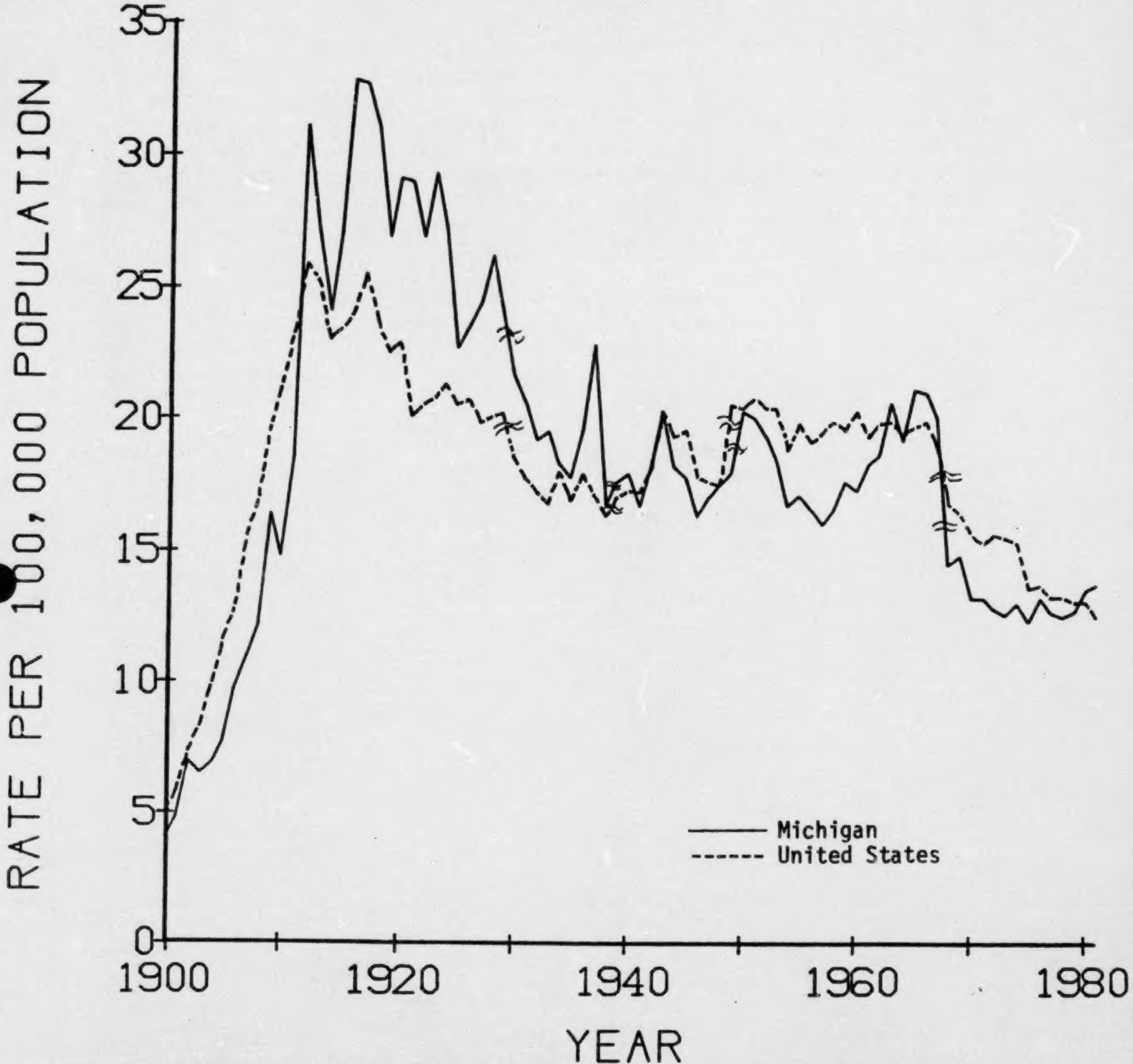
FIGURE 2.38 AGE-SPECIFIC ATHEROSCLEROSIS DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.39 ATHEROSCLEROSIS[1] DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS,[2] 1900-1981[3]



[1] Prior to 1979 termed Arteriosclerosis.

[2] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. U.S. rates for 1980 and 1981 are provisional.

[3] Although Michigan and United States arteriosclerosis death rates are comparable for any given year, changes in the International Classification of Diseases over the years have made historic comparison of these rates extremely difficult. Comparability breaks are especially pronounced in the 1930, 1939, 1949 and 1968 revisions. Analysis of arteriosclerosis death rates over the time period 1900-1981 requires detailed study to maintain comparability.

through 1979 the death rates due to arteriosclerosis in Michigan were below national rates. In 1980 and 1981 the Michigan rate exceeded the national rate. In 1981 the Michigan rate of 13.7 exceeded by 10 percent the provisional rate of 12.5 for the nation.

Age-adjusted atherosclerosis death rates have declined for all population groups in both Michigan and the United States since 1970 (Table 2.42). The rates for white Michigan residents were quite similar to those for the nation, while Michigan's rates for other than white persons were substantially below the comparable rates for the nation (see Technical Notes). Rates for other than white persons were markedly lower than those for white persons in Michigan but only slightly lower for the nation.

Nearly all atherosclerosis deaths are reported as generalized and/or unspecified as to type. Only 61 of the 1,270 deaths were in other classifications. Of these, 59 were attributed to atherosclerosis of arteries of the extremities (Table 2.43).

The 1979 through 1981 mortality data for Michigan indicate that females are more likely to eventually die from atherosclerosis than males. At birth, the likelihood for females is 0.029, while for males it is 0.015. These probabilities rise slowly through age 50 and increase rapidly beyond that age. By age 85, the probability of eventually dying from atherosclerosis is 0.053 for females and 0.041 for males (Figure 2.40).

Table 2.42
Age-Adjusted Atherosclerosis Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981[2]

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	8.1	8.9	7.4	8.2	9.1	7.5	6.2	6.3	5.9
	1971	7.9	9.0	7.1	8.2	9.3	7.3	4.5	4.6	4.4
	1972	7.4	8.7	6.4	7.6	9.0	6.6	4.0	4.0	4.0
	1973	7.2	8.4	6.3	7.5	8.8	6.5	3.9	3.4	4.4
	1974	7.3	8.1	6.7	7.6	8.5	6.9	3.9	3.9	3.9
	1975	6.7	7.5	6.0	6.9	7.8	6.2	4.1	4.9	3.4
	1976	7.0	8.4	6.0	7.3	8.9	6.2	2.8	3.3	2.5
	1977	6.6	7.5	6.0	6.9	7.8	6.2	3.4	3.4	3.5
	1978	6.4	7.2	5.8	6.6	7.4	6.0	4.0	4.7	3.5
	1979	6.3	7.1	5.7	6.4	7.2	5.8	5.2	6.1	4.5
	1980	6.6	7.5	6.0	6.7	7.8	6.1	5.2	5.4	5.0
	1981	6.3	7.1	5.7	6.6	7.5	6.0	3.3	3.8	2.9
U.S.	1970	8.4	9.5	7.5	8.4	9.6	7.5	8.2	9.1	7.5
	1971	8.2	9.0	7.6	8.3	9.1	7.6	7.9	8.4	7.5
	1972	8.2	9.3	7.4	8.2	9.3	7.4	8.4	9.6	7.5
	1973	8.0	8.9	7.3	8.0	9.0	7.2	7.8	8.5	7.2
	1974	7.6	8.6	6.9	7.6	8.7	6.9	7.3	8.2	6.6
	1975	6.6	7.5	5.9	6.6	7.5	5.9	6.1	7.0	5.4
	1976	6.4	7.3	5.8	6.5	7.4	5.8	5.7	6.2	5.3
	1977	6.2	7.1	5.5	6.2	7.2	5.5	5.7	6.4	5.1
	1978	6.0	6.8	5.3	6.0	6.9	5.4	5.6	6.2	5.0
	1979	5.7	6.6	5.1	5.7	6.7	5.1	5.6	6.2	5.2
	1980	5.8[3]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] The introduction in 1979 of the 9th Revision of the International Classification of Diseases, WHO, for coding causes of death resulted in substantial changes in this category, making trend comparisons difficult. The estimated comparability ratio for this category is 1.0649. Note that comparability ratios were developed for comparing crude death rates, and they are not strictly applicable for comparing age-adjusted death rates. For further discussion of comparability ratios see Qualifications and Limitations of Data and Calculations.

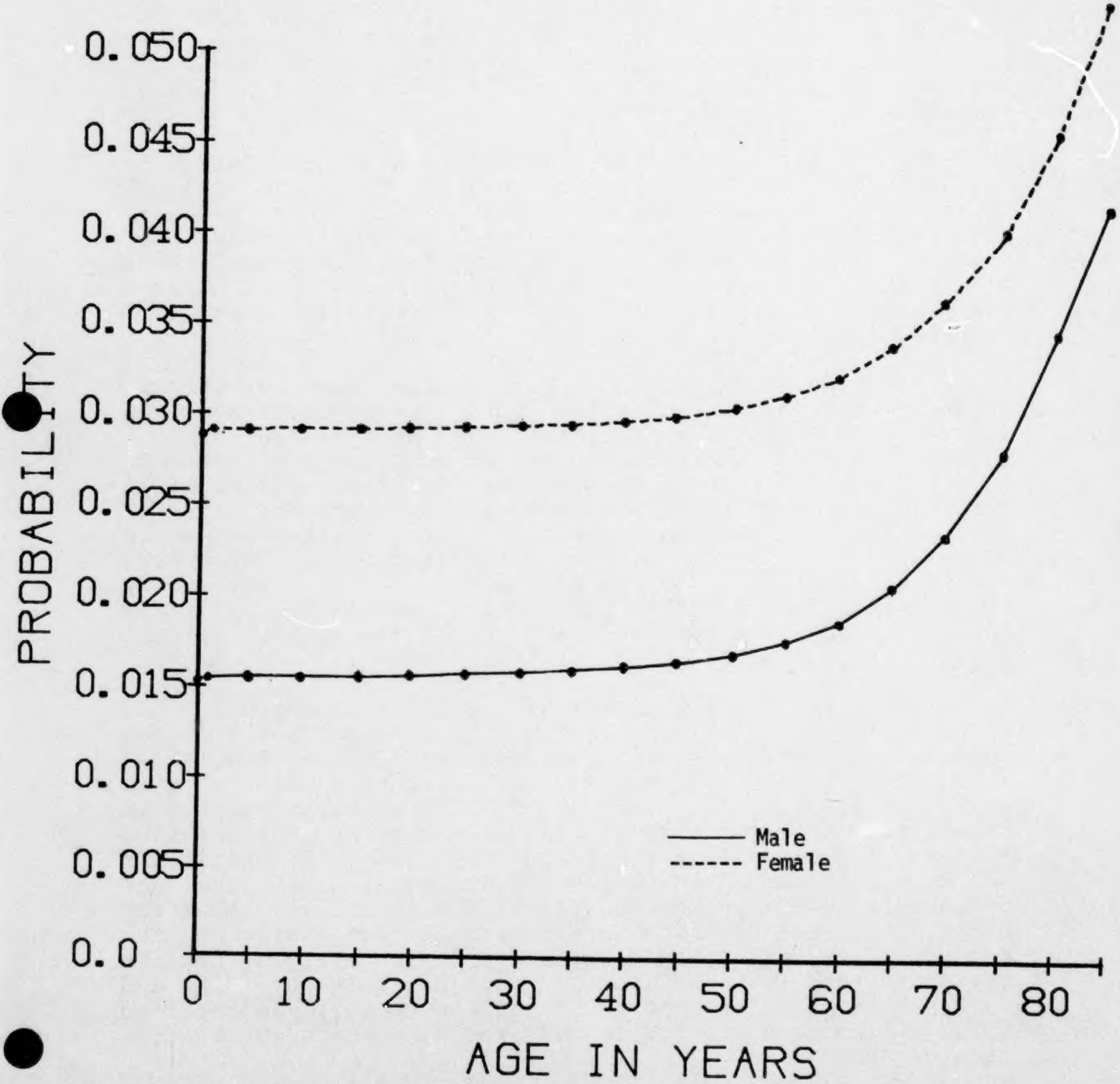
[3] Provisional.

Table 2.43
Deaths Due to Atherosclerosis by Detailed Cause, Michigan Residents, 1981

ICD LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
440.9	Generalized and Unspecified Atherosclerosis .	1,209	95.2
440.2	Atherosclerosis of Arteries of the Extremities	59	4.6
440.0	Atherosclerosis of Aorta	2	0.2
	Total	1,270	100.0

[1] Detailed List of the 9th Revision of the *International Classification of Diseases*, WHO.

FIGURE 2.40 PROBABILITY OF EVENTUALLY DYING FROM ATHEROSCLEROSIS BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

CHRONIC LIVER DISEASE AND CIRRHOSIS

The 9th leading cause of Michigan resident deaths in 1981 was chronic liver disease and cirrhosis. This category was termed cirrhosis of the liver prior to 1979. There were 1,253 deaths attributed to this category in 1981, of which 65.4 percent were to males.

The median age for deaths due to chronic liver disease and cirrhosis (58 years) was 14 years below that for deaths from all causes (Table 2.44). For deaths from this cause in 1981 the median age was 58 years for both males and females. The median ages at death for white males and females were 60 and 61 years, respectively. For other than white males and females the median ages at death were 52 and 51 years, respectively.

Death rates for chronic liver disease and cirrhosis by age, race, and sex are presented in Table 2.45. In 1981 the crude rate for males was twice that for females. The age-adjusted rate for males was 2.2 times that for females. Age-specific rates for males ranged from 1.6 to 2.7 times those for females (Figure 2.41). The highest rate for both males and females was for the age group 65-74 years (73.0 and 28.1 respectively).

The crude mortality rate for deaths due to chronic liver disease and cirrhosis for other than white persons was 63 percent higher than that for white persons and the age-adjusted rate for other than white persons was 2.3 times the rate for white persons. The largest relative differential occurred in the 25-34 year age group, where the rate for other than white persons was 6.8 times that for white persons. The highest age-specific rate for white persons was 48.0 deaths per 100,000 population in the age group 65-74 years. For other than white persons the peak rate (78.3) was observed for the age group 55-64 years (Figure 2.42).

Cirrhosis of the liver was the cause of death for 7.9 of every 100,000 Michigan residents in 1900. Death rates due to this cause rose to a peak of 13.1 in 1916, after which the relative frequency of cirrhosis deaths fell sharply, dropping to 7.4 in 1919. The Michigan rates held stable from this point until 1936 when they began increasing slowly. A peak of 12.4 was reached by 1948. The statistics for Michigan shown in Figure 2.43 after 1949 are not comparable with preceding years due to a revision of the underlying cause of death determination. By isolating the period 1950-1981, this problem can be ignored. Michigan's mortality rate for this disease doubled between 1950 and 1972, when the highest rate of the century was recorded (19.7). The rate of 13.5 in 1981 was 31 percent below the rate of 1972.

Table 2.44
Deaths Due to Chronic Liver Disease and Cirrhosis by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	1	1	-	1	1	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	-	-	-	-	-	-	-	-	-	-	-	-
15-19	-	-	-	-	-	-	-	-	-	-	-	-
20-24	3	2	1	1	1	-	2	1	1	-	-	-
25-29	16	10	6	7	6	1	9	4	5	-	-	-
30-34	48	29	19	21	15	6	27	14	13	-	-	-
35-39	59	38	21	31	21	10	28	17	11	-	-	-
40-44	65	44	21	41	28	13	24	16	8	-	-	-
45-49	125	83	42	91	61	30	34	22	12	-	-	-
50-54	174	113	61	130	84	46	44	29	15	-	-	-
55-59	195	134	61	146	104	42	49	30	19	-	-	-
60-64	188	124	64	158	104	54	30	20	10	-	-	-
65-69	170	119	51	149	105	44	21	14	7	-	-	-
70-74	101	63	38	93	61	32	8	2	6	-	-	-
75-79	58	33	25	51	30	21	7	3	4	-	-	-
80-84	26	19	7	23	17	6	3	2	1	-	-	-
85-89	21	7	14	20	6	14	1	1	-	-	-	-
90+	3	1	2	3	1	2	-	-	-	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1253	820	433	966	645	321	287	175	112	-	-	-
Median Age At Last Birthday	58	58	58	60	60	61	52	52	51	*	*	*

Table 2.45
Death Rates for Deaths Due to Chronic Liver Disease and Cirrhosis, by Age, Race, and Sex[1], Michigan Residents, 1981

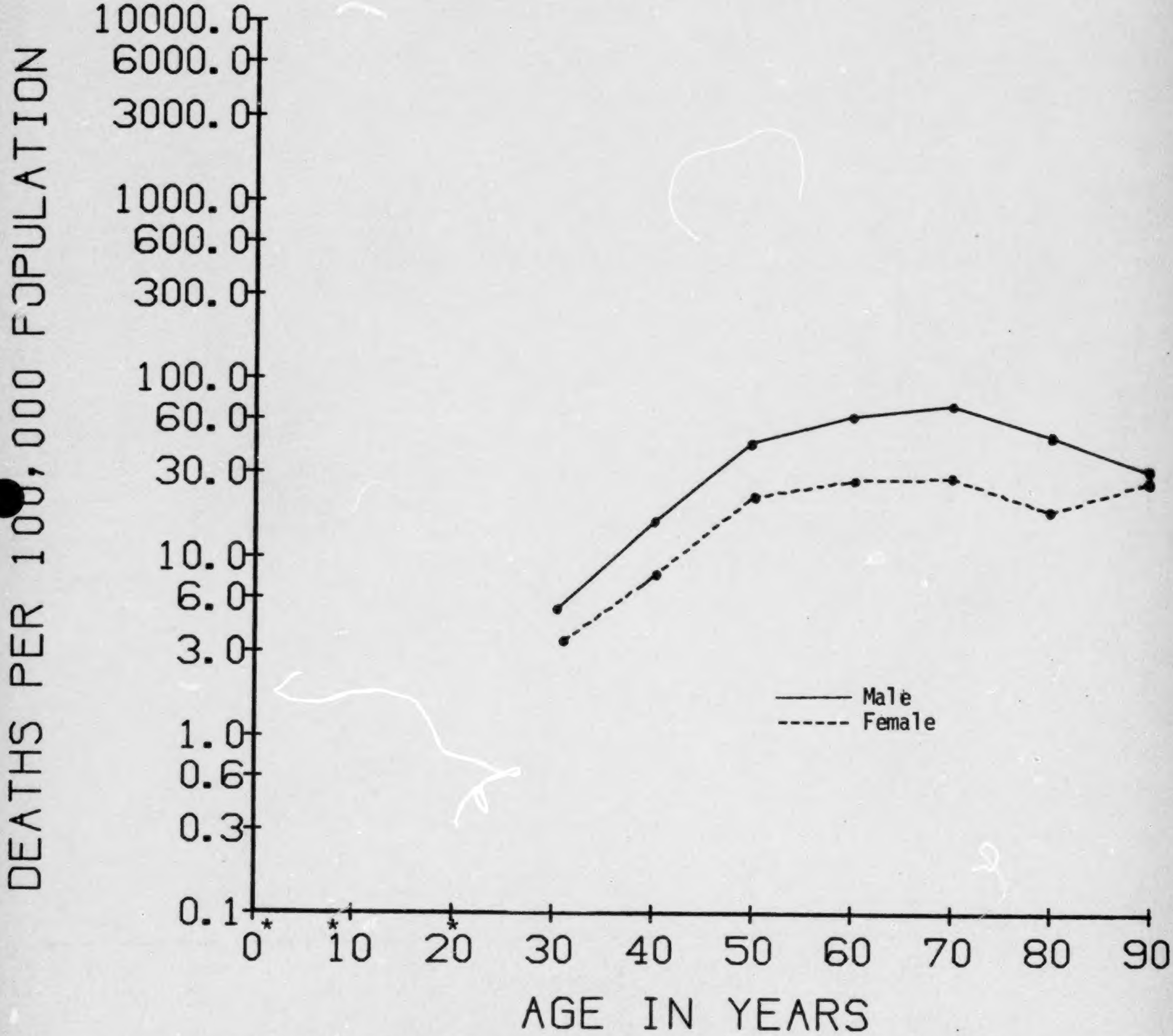
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	13.5	18.2	9.1	12.3	16.8	8.0	20.1	25.7	15.0
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	*	*	*	*	*	*	*	*	*
15-24 Years	*	*	*	*	*	*	*	*	*
25-34 Years	4.1	5.0	3.1	2.1	3.2	1.1	14.2	15.3	13.2
35-44 Years	11.7	15.8	7.8	7.9	10.9	5.0	35.3	48.0	24.2
45-54 Years	32.8	44.3	22.0	27.9	37.4	18.8	65.9	93.6	42.2
55-64 Years	43.8	62.3	27.2	39.3	56.7	23.7	78.3	105.5	54.3
65-74 Years	47.9	73.0	28.1	48.0	74.8	26.9	47.0	58.5	37.9
75-84 Years	29.8	48.8	18.3	29.0	49.1	16.9	38.0	46.2	32.3
85 Years and Over	28.3	30.4	27.3	29.3	29.0	29.5	*	*	*
Age-Adjusted Rate[2]	12.6	17.8	8.1	10.8	15.6	6.7	24.4	32.6	17.4

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

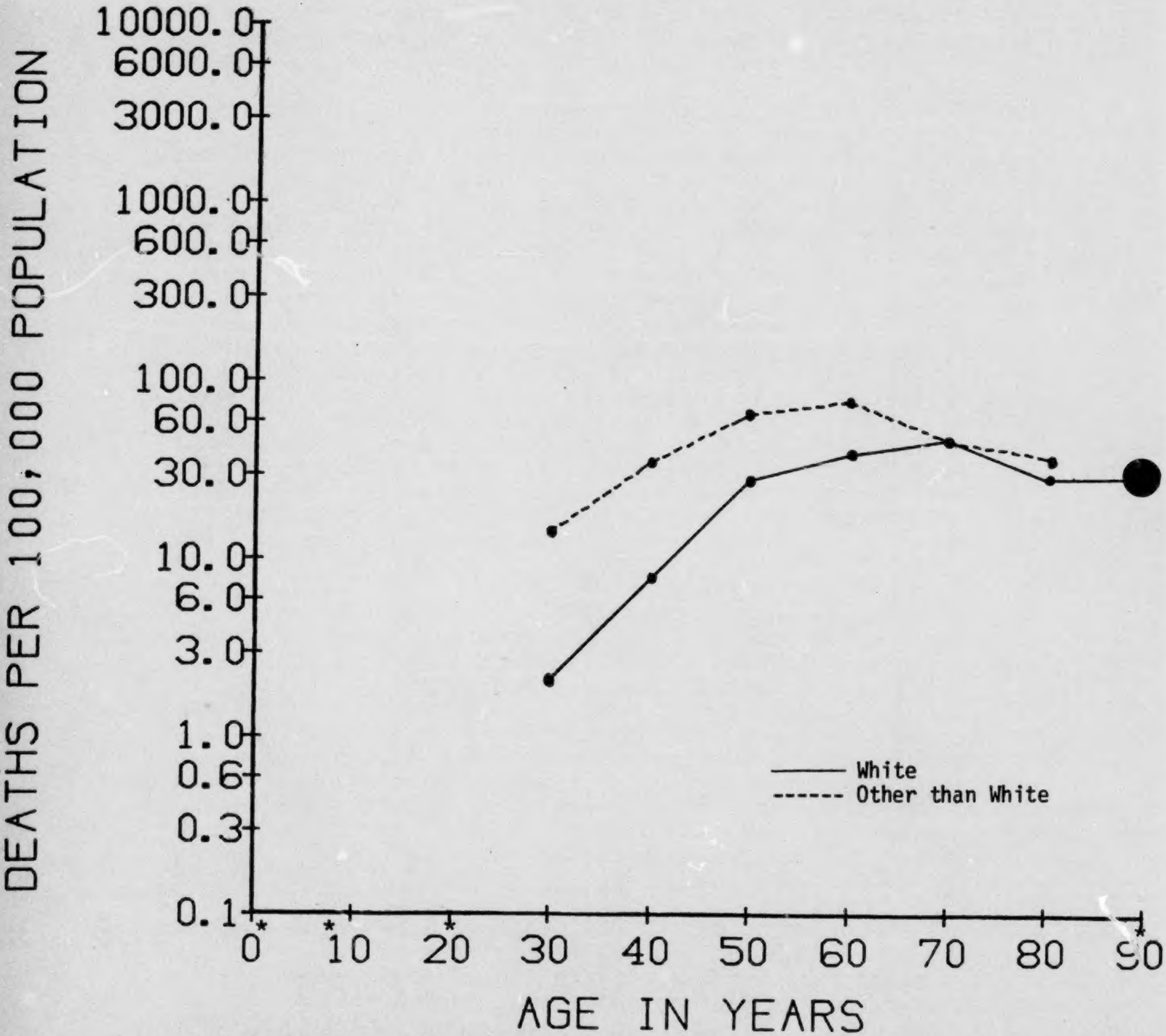
FIGURE 2.41 AGE-SPECIFIC CHRONIC LIVER DISEASE AND CIRRHOSIS DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.42 AGE-SPECIFIC CHRONIC LIVER DISEASE AND CIRRHOSIS DEATH RATES[1] BY RACE, MICHIGAN RESIDENTS, 1981



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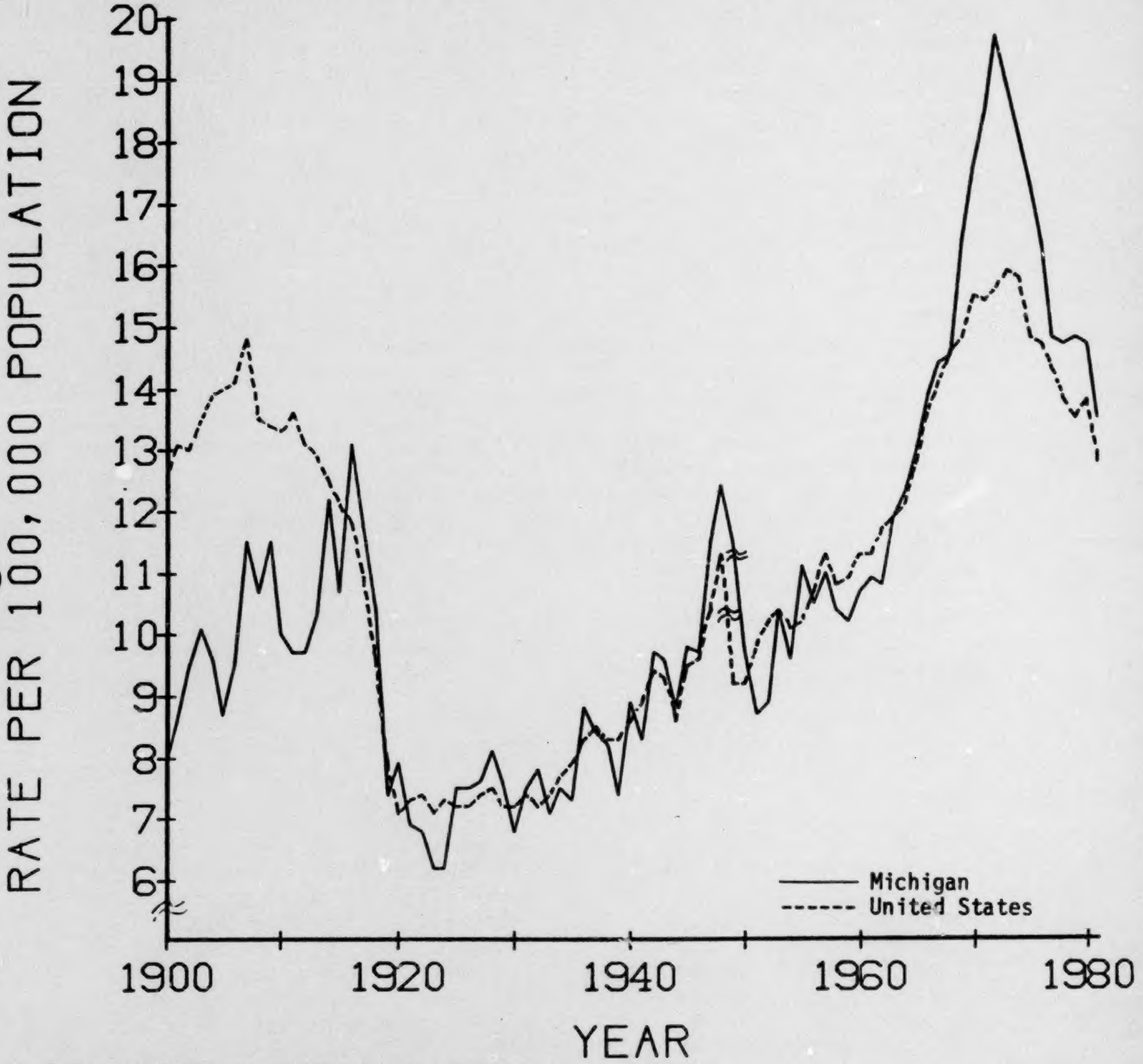
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.43 CHRONIC LIVER DISEASE AND CIRRHOSIS[1] DEATH RATES

MICHIGAN AND UNITED STATES RESIDENTS,[2] 1900-1981[3]



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[1] Prior to 1979 termed Cirrhosis of liver.

[2] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. U.S. rates for 1980 and 1981 are provisional.

[3] The comparability of cirrhosis of the liver death rates from the 5th revision of the ICDA coding procedures with those of the 6th revision is considered weak. The comparability ratio is estimated to be .80. The 6th revision was adopted in 1949 for national cause-of-death statistics and in 1950 for Michigan statistics. The comparability of cirrhosis of the liver death rates through the 6th, 7th, 8th, and 9th revisions (1949 to date nationally and 1950 to date in Michigan) is high. General comparison before and after these dates of adoption can be made but detailed study requires special consideration. See Technical Notes.

The cirrhosis of the liver mortality rate for the United States was well above Michigan's rate early in this century. The highest rate for the nation during the first half of the century occurred in 1907 (14.8). The rates for Michigan and the nation were similar from about 1916 through 1968. Between 1968 and 1972, rates for Michigan rose above those for the nation. The sharp drop in Michigan's rate since 1972 has brought the statistic for the state closer to the national figure. In 1981 the chronic liver disease and cirrhosis death rate of 13.5 for Michigan was 4.7 percent above the provisional rate of 12.9 for the nation.

Age-adjusted death rates by sex and race for chronic liver disease and cirrhosis for the years 1970-1981 are recorded in Table 2.46 (see Technical Notes). These rates generally peaked about 1972 in Michigan and have tended to decline since then. For the U.S. the increases observed in the early part of the decade were less pronounced, as were the declines after that time. The rates in Michigan for other than white males have been substantially higher than for all other groups, including the rates for other than white males observed nationally. The rates for other than white females in Michigan have also been considerably higher than the comparable rates for the nation. Rates for white males in Michigan were higher than rates for white males nationally throughout the decade. Rates for white females in Michigan were higher than for their counterparts in the nation at the beginning of the decade. In recent years the rates for the two groups have been similar. The age-adjusted rate for the total population of Michigan in 1980 was 12 percent above the provisional rate for the United States.

Cirrhosis of the liver without mention of alcohol was the most frequently reported cause of deaths due to chronic liver disease and cirrhosis in 1981, resulting in 676 deaths (Table 2.47). The second largest category was alcoholic cirrhosis of the liver with 271 deaths. There were 126 deaths attributed to other chronic nonalcoholic liver disease. Including deaths due to alcoholic cirrhosis of the liver, alcoholic fatty liver, acute alcoholic hepatitis, and unspecified alcoholic liver damage, there were 386 deaths with mention of alcohol attributed to the category of chronic liver disease and cirrhosis. The total number of alcohol-related deaths in 1981 was 523. This figure includes 12 deaths due to alcoholic psychoses, 93 due to alcohol dependence syndrome, 28 due to nondependent abuse of alcohol, and an additional 4 deaths due to accidental poisoning by alcohol. It should be noted that these numbers do not include deaths from motor vehicle and other accidents in which alcohol was involved.

The probability of eventually dying from chronic liver disease and cirrhosis, based upon Michigan mortality data

Table 2.46

Age-Adjusted Death Rates[1] for Deaths Due to Chronic Liver Disease and Cirrhosis by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	17.7	24.9	11.2	15.6	22.0	9.7	34.8	48.3	22.5
	1971	18.7	25.6	12.3	16.2	22.2	10.8	37.4	52.8	23.6
	1972	19.8	27.8	12.5	17.0	24.5	10.3	40.7	54.2	28.5
	1973	18.8	26.7	11.7	16.3	23.3	10.1	37.0	52.7	23.0
	1974	17.9	25.8	10.8	14.8	21.5	8.7	40.9	58.2	25.4
	1975	17.1	23.9	11.1	14.4	20.3	9.2	36.2	50.2	23.8
	1976	15.9	23.0	9.6	13.6	19.9	8.1	31.9	45.5	19.8
	1977	14.5	20.6	9.1	12.1	17.7	7.2	30.6	41.2	21.2
	1978	14.2	19.6	9.3	12.1	16.9	7.9	28.5	39.1	19.3
	1979	14.2	21.1	8.2	11.5	17.2	6.4	32.5	47.8	19.3
	1980	14.1	19.7	9.1	11.7	16.6	7.3	29.7	41.4	19.6
	1981	12.6	17.8	8.1	10.8	15.6	6.7	24.4	32.6	17.4
U.S.	1970	14.7	20.2	9.8	13.4	18.8	8.7	23.8	31.3	17.4
	1971	14.7	20.4	9.8	13.5	18.9	8.8	24.3	32.2	17.5
	1972	14.9	20.8	9.6	13.5	19.1	8.6	25.4	35.1	17.2
	1973	15.0	20.9	9.9	13.7	19.3	8.7	25.3	33.9	18.0
	1974	14.8	20.7	9.7	13.4	19.0	8.6	25.0	34.0	17.4
	1975	13.8	19.5	8.9	12.6	17.9	7.9	23.1	32.1	15.5
	1976	13.6	19.1	8.7	12.3	17.5	7.7	23.1	32.3	15.4
	1977	13.1	18.4	8.4	11.8	16.7	7.5	22.5	31.4	15.0
	1978	12.5	17.6	8.1	11.3	16.1	7.2	21.0	29.1	14.3
	1979	12.2	17.1	7.8	11.1	15.7	7.1	20.1	28.3	13.1
	1980	12.6[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Provisional.

Table 2.47
Deaths Due to Chronic Liver Disease and Cirrhosis by Detailed Cause, Michigan Residents, 1981

ICD LIST[1] NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
571.5	Cirrhosis of Liver Without Mention of Alcohol	676	54.0
571.2	Alcoholic Cirrhosis of Liver	271	21.6
571.8	Other Chronic Nonalcoholic Liver Disease . .	126	10.1
571.3	Alcoholic Liver Damage, Unspecified	44	3.5
571.0	Alcoholic Fatty Liver	42	3.4
571.4	Chronic Hepatitis	35	2.8
571.1	Acute Alcoholic Hepatitis	29	2.3
571.6	Biliary Cirrhosis	17	1.4
571.9	Unspecified Chronic Liver Disease Without . . Mention of Alcohol	13	1.0
	Total	1,253	100.0

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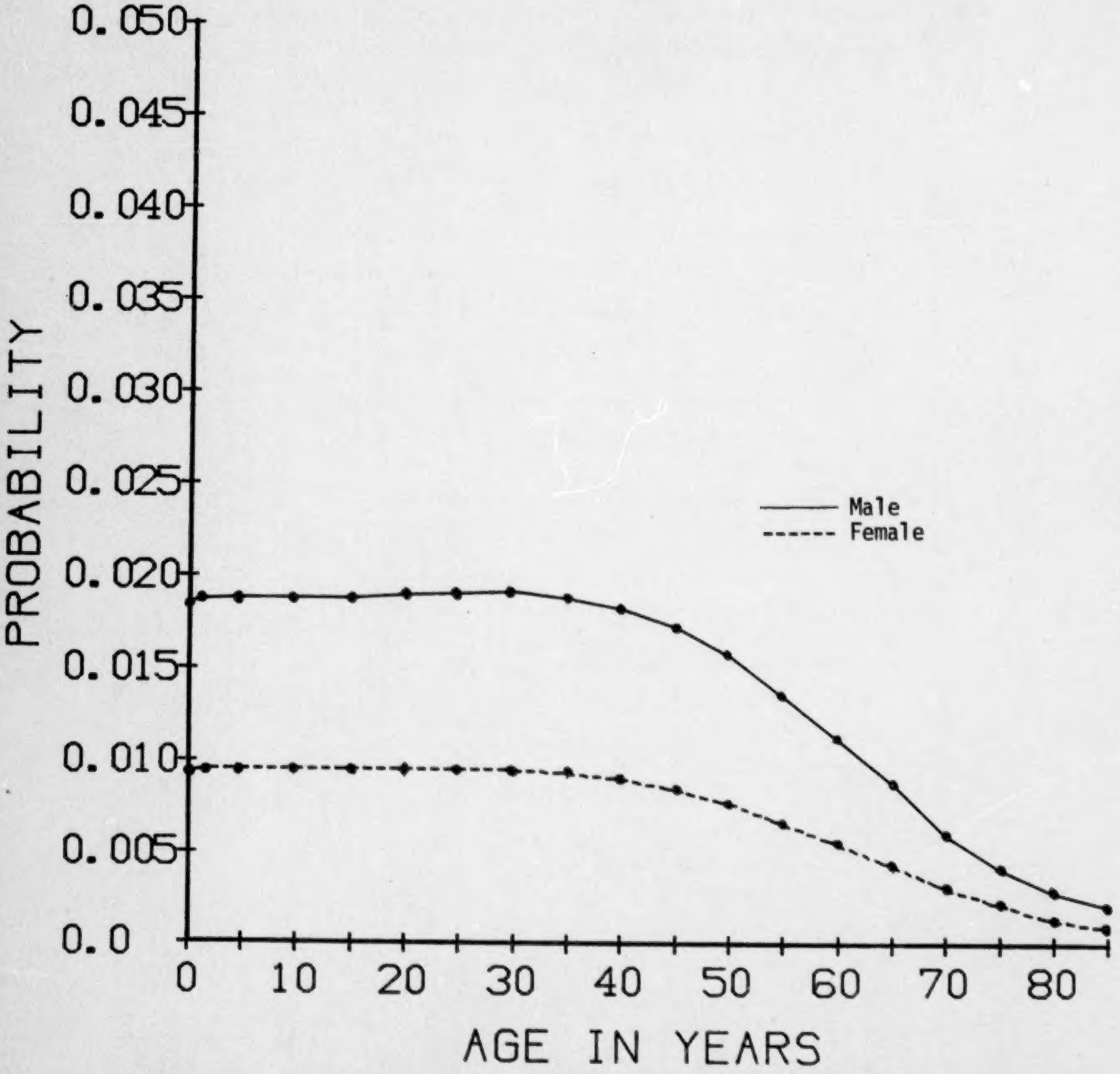
[1] Detailed List of the 9th Revision of the International Classification of Diseases, WHO.

from the years 1979-1981, is displayed in Figure 2.44 by age and sex. This graph reveals that the risk for males of dying from a disease in this category is consistently about double that for females. At birth, males have a probability of 0.018 of eventually dying from chronic liver disease and cirrhosis. For females the probability is 0.009. These probabilities remain nearly constant for both sexes through age 40, whereupon the threat of death due to these diseases diminishes with advancing age. By age 85 the risk is 0.002 for males and 0.001 for females.

FIGURE 2.44 PROBABILITY OF EVENTUALLY DYING FROM CHRONIC LIVER DISEASE AND CIRRHOSIS BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

SUICIDE

There were a total of 1,074 suicide deaths in 1981, making suicide the 10th leading cause of death. Of the deaths resulting from suicide 75.0 percent were to males. 91.2 percent of all suicide deaths were to white persons.

Fifty percent of all suicide deaths occurred at or below the age of 39. The median age at death for males was 38 years, 3 years below that for females. The median ages at death for white males and females were 39 and 42 years respectively. For other than white males the median age at death was 29 years (Table 2.48).

The crude suicide death rate in 1981 was 11.6 per 100,000 population. The crude rate for males (17.8) was 3.2 times that for females (5.6). Age-specific rates for males were higher in all age groups (Table 2.49 and Figure 2.45). While suicide rates for males were highest among men from 25-34 years and those aged 65 or older, the rates for females were highest from age 35 through 64 and declined in the older age groups. The greatest relative differential by sex was in the 75-84 year age group where the rate for males was 15 times that for females.

The crude suicide death rate for the white population was 89 percent higher than that for the other than white population. The age-adjusted rate for white persons was 76 percent higher than that for other than white persons. Age-specific rates by race from Table 2.49 are displayed in Figure 2.46. Age-specific rates for white persons were greater than those for other than white persons in all categories with sufficient events to calculate rates. There were 150 suicide deaths of white persons 65 years of age or older. This is 15.3 percent of all suicide deaths of white persons. Among persons of other races there were 6 suicide deaths at age 65 or over (6.4 percent of the total).

There is strong similarity in both the trend and magnitude of suicide death rates for Michigan and the United States in this century (Figure 2.47). There were two complete cycles of rising then falling rates in the period 1900 through 1944. The rates then held fairly stable for about 20 years. Between 1964 and 1977 the suicide death rate increased by 39 percent in Michigan, reaching 14.0, the highest rate since 1938. The highest rate during this century for Michigan was 18.8 in 1931, while the lowest was the rate of 8.8 in 1900. For the nation high and low rates were observed in 1932 (17.4) and in 1957 (9.8). In 1981 the provisional rate for the United States was 12.3, compared to Michigan's rate of 11.6.

Age-adjusted suicide death rates by race and sex for Michigan and the United States are presented in Table 2.50.

Table 2.48
Deaths Due to Suicide by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER			RACE NOT STATED		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	-	-	-	-	-	-	-	-	-	-	-	-
1-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	4	3	1	4	3	1	-	-	-	-	-	-
15-19	69	58	11	63	53	10	6	5	1	-	-	-
20-24	142	120	22	124	105	19	18	15	3	-	-	-
25-29	137	111	26	116	92	24	21	19	2	-	-	-
30-34	112	77	35	93	64	29	19	13	6	-	-	-
35-39	96	63	33	89	57	32	7	6	1	-	-	-
40-44	66	47	19	62	43	19	4	4	-	-	-	-
45-49	67	41	26	61	36	25	6	5	1	-	-	-
50-54	86	57	29	82	55	27	4	2	2	-	-	-
55-59	75	53	22	73	51	22	2	2	-	-	-	-
60-64	64	44	20	63	43	20	1	1	-	-	-	-
65-69	55	44	11	54	43	11	1	1	-	-	-	-
70-74	40	32	8	39	31	8	1	1	-	-	-	-
75-79	31	27	4	27	23	4	4	4	-	-	-	-
80-84	19	18	1	19	18	1	-	-	-	-	-	-
85-89	8	8	-	8	8	-	-	-	-	-	-	-
90+	3	3	-	3	3	-	-	-	-	-	-	-
Not Stated	-	-	-	-	-	-	-	-	-	-	-	-
All Ages	1074	806	268	980	728	252	94	78	16	-	-	-
Median Age At Last Birthday	39	38	41	40	39	42	30	29	*	*	*	*

Table 2.49
Suicide Death Rates by Age, Race, and Sex[1], Michigan Residents, 1981

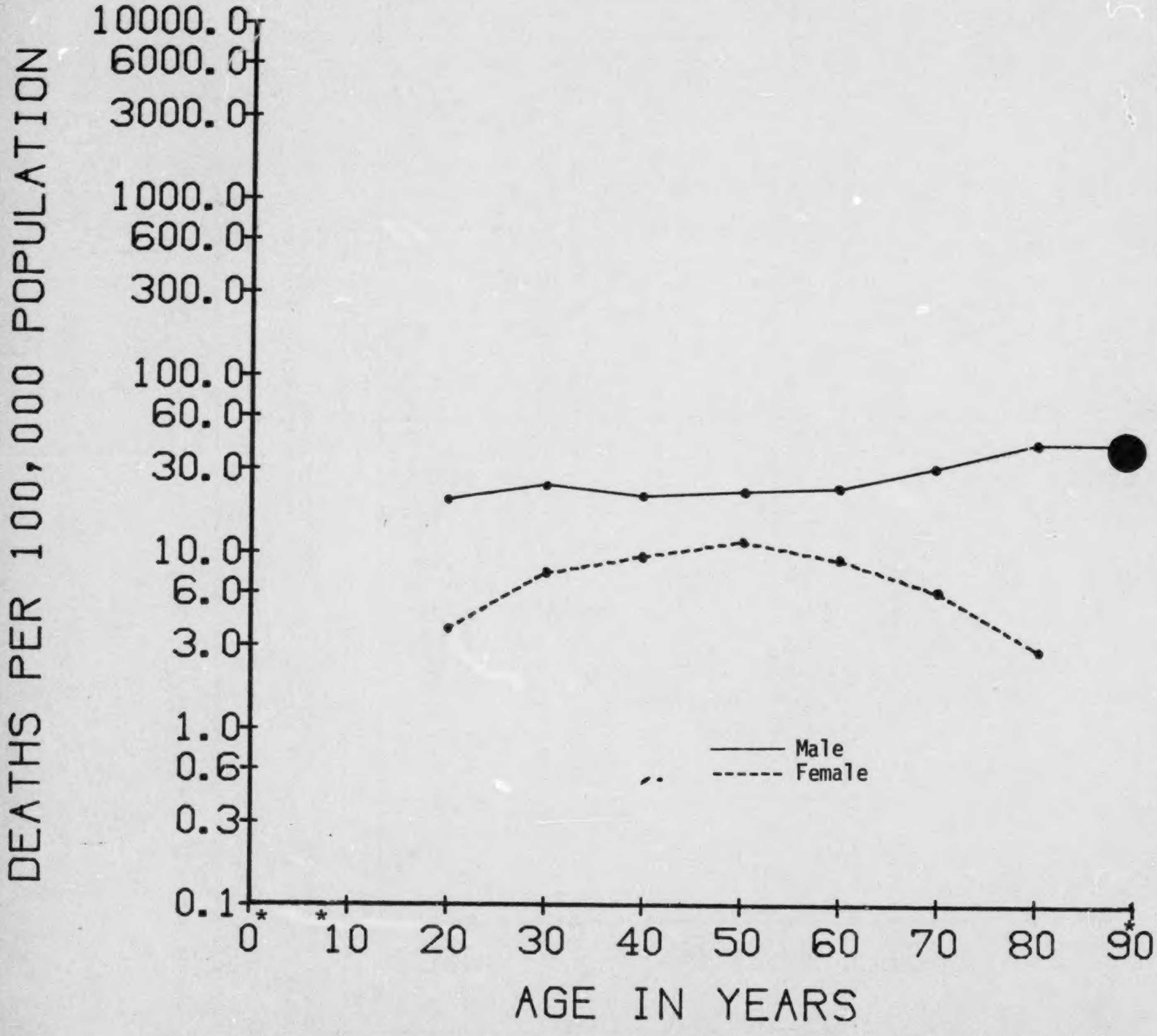
AGE	ALL RACES			WHITE			OTHER THAN WHITE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
All Ages-Crude Rate	11.6	17.8	5.6	12.5	19.0	6.3	6.6	11.5	2.1
Under 1 Year	*	*	*	*	*	*	*	*	*
1-14 Years	*	*	*	*	*	*	*	*	*
15-24 Years	12.0	20.2	3.7	12.6	21.2	3.9	8.5	14.6	*
25-34 Years	15.8	24.2	7.7	15.8	23.7	8.0	15.7	27.2	5.8
35-44 Years	15.3	21.2	9.6	16.6	22.3	11.1	7.5	14.5	*
45-54 Years	16.8	22.2	11.7	18.1	23.5	12.9	8.4	12.9	*
55-64 Years	15.9	23.4	9.1	17.6	25.6	10.4	*	*	*
65-74 Years	16.8	30.5	6.0	18.4	33.4	6.7	*	*	*
75-84 Years	17.7	42.2	2.9	18.0	42.8	3.1	*	*	*
85 Years and Over	13.0	41.8	*	14.0	45.5	*	*	*	*
Age-Adjusted Rate[2]	11.3	17.4	5.7	12.0	18.2	6.3	6.8	12.1	2.2

[1] Deaths with sex or race not stated were randomly allocated prior to computation of age-specific death rates. Deaths with age not stated were included in the category 85 and over.

[2] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

* Rate is considered statistically unreliable.

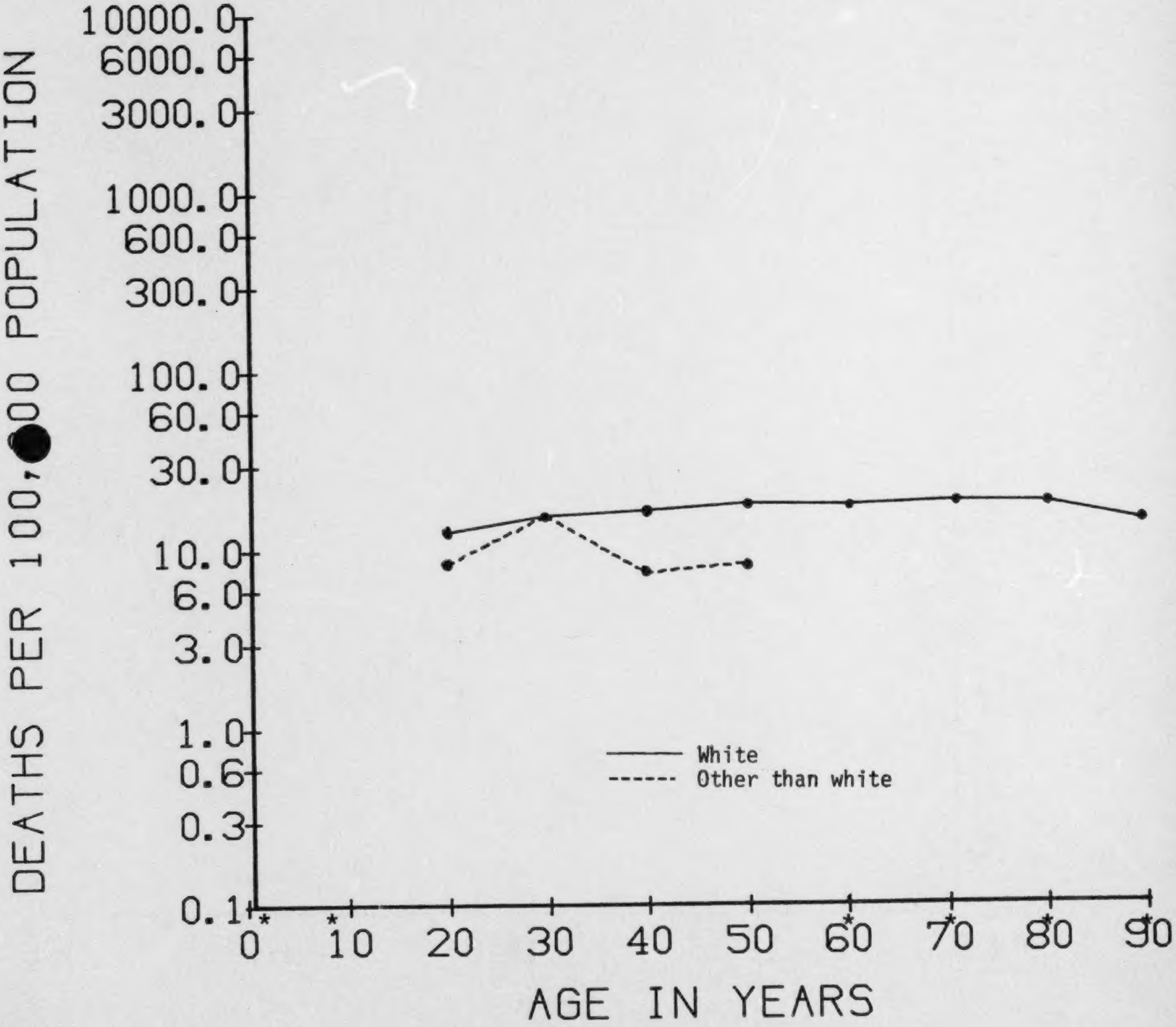
FIGURE 2.45 AGE-SPECIFIC SUICIDE DEATH RATES[1] BY SEX, MICHIGAN RESIDENTS, 1981



[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.46 AGE-SPECIFIC SUICIDE DEATH RATES[1] BY RACE,
MICHIGAN RESIDENTS, 1981



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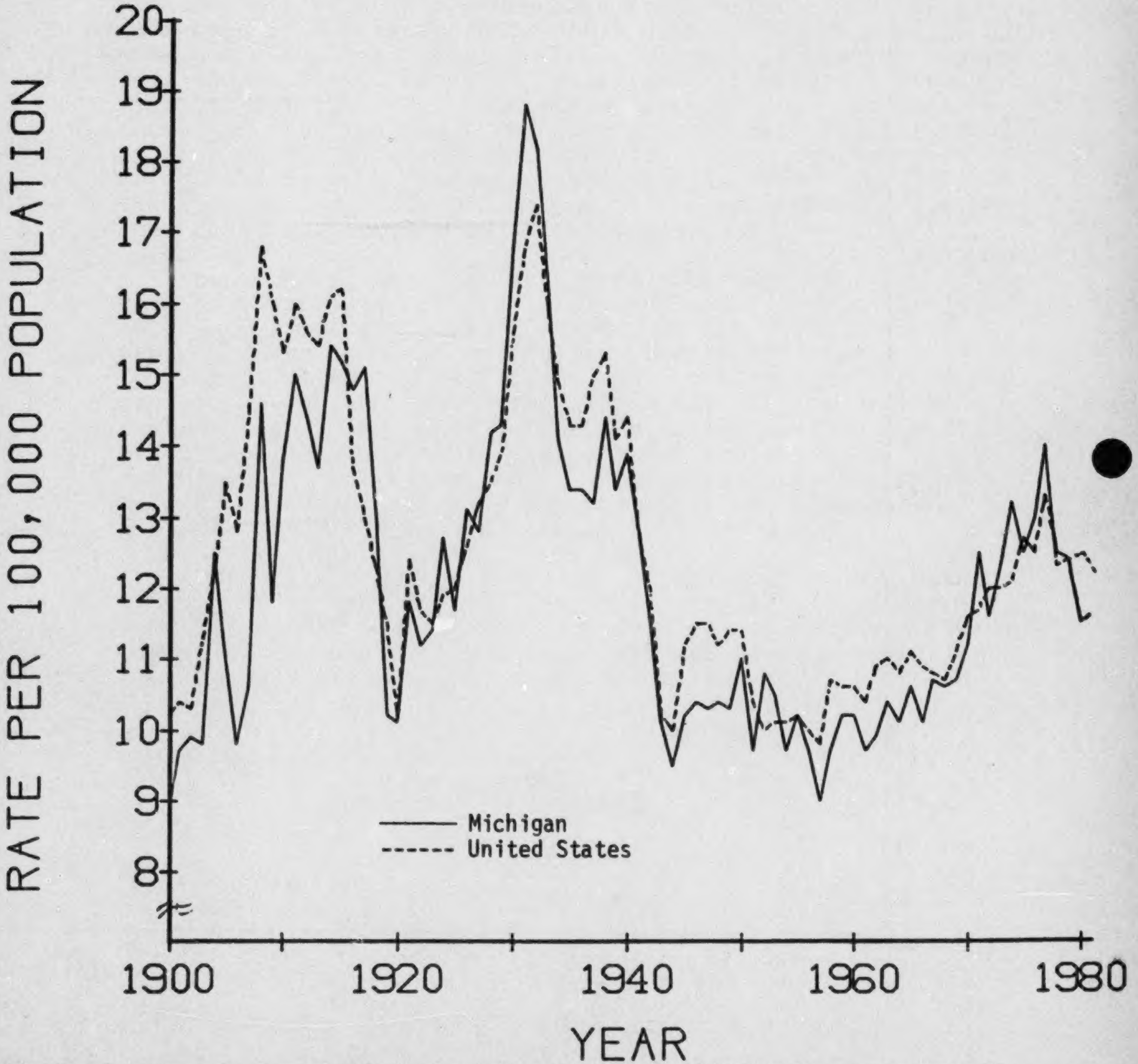
[1] Note that death rates are shown on a logarithmic scale: vertical distances represent relative differences in rate rather than absolute differences.

*Rate is considered statistically unreliable.

FIGURE 2.47 SUICIDE DEATH RATES, MICHIGAN AND UNITED STATES RESIDENTS,[1] 1900-1981[2]



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[1] National rates are from death registration states for 1900-1932 and the United States for 1933-1981. U.S. rates for 1980 and 1981 are provisional.

[2] Suicide death rates since 1900 are suitable for general comparison over time but detailed study (such as time series) requires special consideration. See Technical Notes.

Table 2.50

Age-Adjusted Suicide Death Rates[1] by Race and Sex, Michigan and United States Residents, 1970-1981

PLACE	YEAR	ALL RACES			WHITE			OTHER THAN WHITE		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Mich.	1970	11.9	17.3	6.9	12.4	17.9	7.3	7.4	11.8	3.4
	1971	13.0	18.2	8.4	13.3	18.4	8.6	10.6	15.8	6.0
	1972	12.1	17.9	6.9	12.6	18.4	7.3	8.2	12.6	4.2
	1973	12.8	19.3	6.7	13.2	19.9	7.0	9.4	15.4	4.1
	1974	13.6	19.9	8.0	14.2	20.7	8.3	8.9	13.1	5.2
	1975	12.9	19.4	6.8	13.3	19.9	7.1	9.5	15.0	4.5
	1976	13.2	19.8	7.0	13.5	20.3	7.3	10.2	16.0	5.1
	1977	13.9	21.4	7.1	14.5	22.2	7.4	9.6	15.5	4.4
	1978	12.2	18.8	6.2	12.6	19.4	6.3	9.7	14.6	5.5
	1979	12.2	18.6	6.3	12.4	18.8	6.5	10.7	16.9	5.1
	1980	11.2	17.7	5.2	11.8	18.4	5.6	7.5	12.8	2.7
	1981	11.3	17.4	5.7	12.0	18.2	6.3	6.8	12.1	2.2
U.S.	1970	11.8	17.3	6.8	12.4	18.2	7.2	6.5	10.3	3.3
	1971	11.9	17.2	7.1	12.5	18.0	7.5	7.0	10.4	3.9
	1972	12.1	17.9	6.9	12.7	18.5	7.4	7.5	11.9	3.6
	1973	12.0	18.0	6.6	12.6	18.7	7.1	7.2	11.6	3.3
	1974	12.2	18.2	6.7	12.8	19.0	7.1	7.2	11.7	3.3
	1975	12.6	19.0	6.9	13.3	19.8	7.3	7.5	12.1	3.5
	1976	12.3	18.5	6.6	12.9	19.2	7.0	7.6	12.3	3.5
	1977	12.9	19.7	6.8	13.6	20.6	7.2	7.8	12.6	3.7
	1978	12.0	18.5	6.2	12.7	19.2	6.6	7.4	12.2	3.2
	1979	11.9	18.3	6.0	12.4	18.9	6.4	7.9	13.1	3.4
	1980	12.2[2]	---	---	---	---	---	---	---	---
	1981	---	---	---	---	---	---	---	---	---

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[1] Based on age-specific death rates per 100,000 population in specified group. Computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940; see Technical Notes.

[2] Provisional.

For Michigan white females the age-adjusted rate for suicide remained quite stable from 1970 through 1977, and has since declined, while that for white males increased between 1970 and 1977, and has fallen in each of the last four years. The rates for other than white persons, though exhibiting no clear trend, were consistently below those of their white counterparts throughout the period. Rates for the nation were more stable. For white and other than white females the rates showed no clear trend. The rate for white males peaked in 1977, and the rate for other than white males increased by 27 percent between 1970 and 1979. The rates in Michigan for the other than white population were significantly higher than those of the nation. Rates in Michigan for the white population groups were similar to those of the nation. The age-adjusted rate for the total population of Michigan was at or above the comparable national rate each year from 1970 through 1979. In 1980 the state rate was 8.2 percent below the provisional rate for the United States (see Technical Notes).

Suicides in Michigan were predominantly the result of one of four types of self-inflicted injury. Self-inflicted injury by firearms caused 579 deaths in 1981. Hanging, strangulation and suffocation resulted in 160 deaths. Self-inflicted poisoning by gases and vapors resulted in 153 deaths, of which 126 were attributed to motor vehicle exhaust gas and another 24 to other carbon monoxide poisoning. There were 95 deaths due to poisoning by drugs, medicaments, and biologicals. Together these four types of suicide accounted for 91.9 percent of all suicide deaths to Michigan residents in 1981 (Table 2.51).

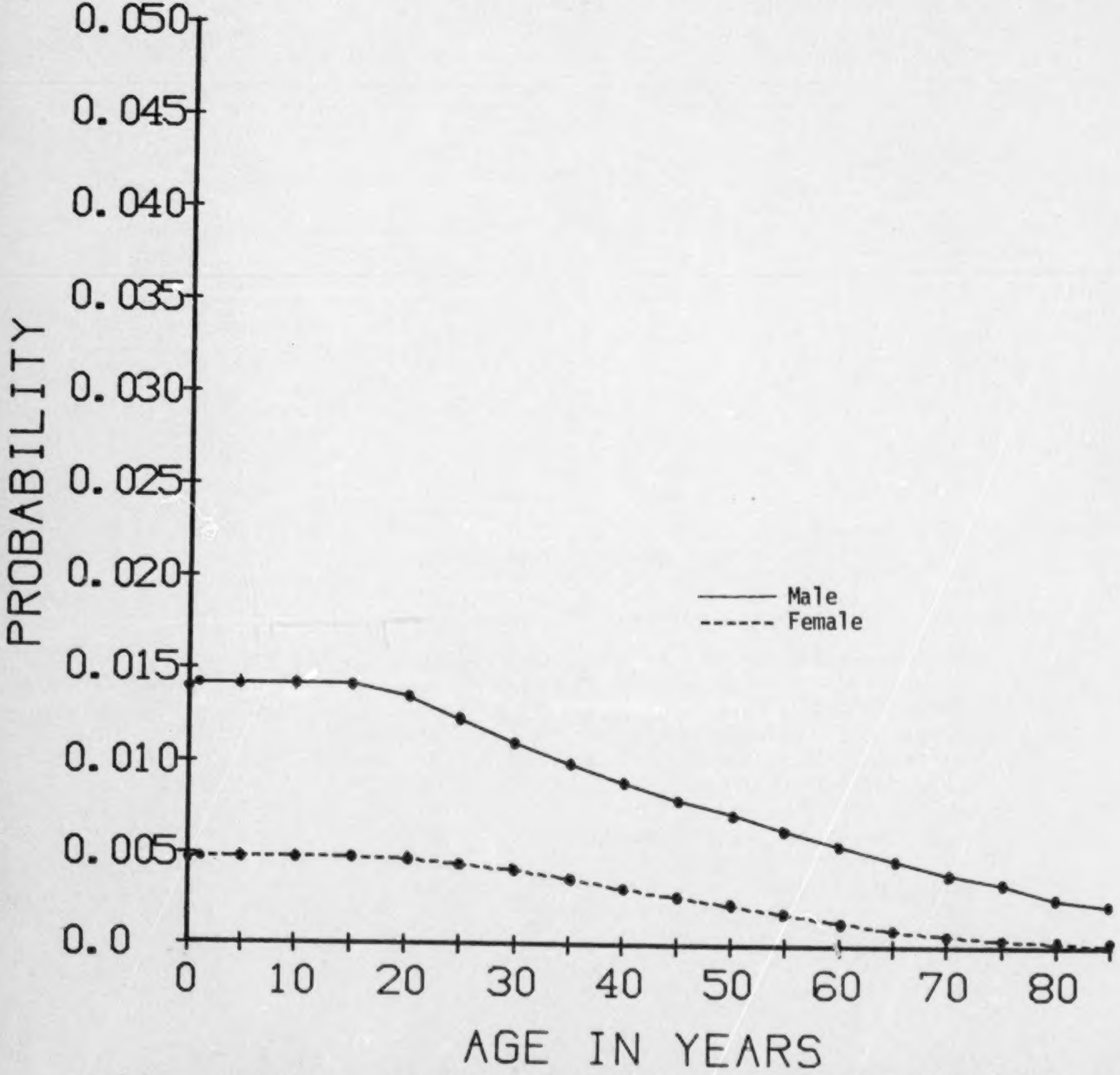
Using the Michigan mortality experience of 1979 through 1981, the chance of a male eventually dying from suicide is 0.014 at birth. The risk for females is 0.005. These probabilities hold relatively constant through age 20 then taper slowly with advancing age (Figure 2.48).

Table 2.51
Deaths Due to Suicide by Method, Michigan Residents, 1981

282 LIST' NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
269	Suicide by All Other and Unspecified Firearms . . .	568	52.9
267	Suicide by Hanging, Strangulation, and Suffocation .	160	14.9
266	Suicide by Gases and Vapors	153	14.2
264	Suicide by Drugs, Medicaments, and Biologicals . . .	95	8.8
270	Suicide by All Other Means and Late Effects of Self-Inflicted Injury	77	7.2
268	Suicide by Handgun	11	1.0
265	Suicide by Other Solid or Liquid Substances	10	0.9
	Total	1,074	100.0

'List of 282 Selected Causes developed by the National Center for Health Statistics for tabulation of mortality data coded by the 9th Revision of the International Classification of Diseases, WHO.

FIGURE 2.48 PROBABILITY OF EVENTUALLY DYING FROM SUICIDE BY AGE AND SEX, MICHIGAN RESIDENTS, 1979-1981[1]



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[1] Note: Should comparisons be desired between this graph and a similar graph contained herein that pertains to some other specified cause of death, differences in scale may be encountered.

THE PROBABILITY OF EVENTUAL DEATH DUE TO A SPECIFIED CAUSE

While cause-specific death rates are useful in gauging the frequency of death due to certain causes and in making comparisons between areas or populations, they do not relate the risk that the condition imposes on the population with clarity. Mortality data can be used to develop this risk in probabilistic terms. Through the application of life expectancy techniques, a probability of death due to a given cause can be estimated. Such probabilities represent the average risk of eventual death being caused by a specified condition under an assumption that the mortality across all ages that was observed in a time period will remain unchanged through the remaining life of the population. These probabilities can be estimated for any given age attained. The following table relates the probability at birth of dying from the ten leading causes of death based upon Michigan mortality experience for the years 1979 through 1981.

DISEASE CATEGORY	PROBABILITY AT BIRTH OF EVENTUAL DEATH DUE TO CONDITION FOR:	
	Males	Females
Diseases of the Heart	.422	.439
Malignant Neoplasms	.210	.184
Cerebrovascular Diseases	.072	.118
Accidents and Adverse Effects	.043	.024
Chronic Obstructive Pulmonary Diseases and Allied Conditions	.039	.017
Pneumonia and Influenza	.025	.027
Diabetes Mellitus	.016	.025
Atherosclerosis	.015	.029
Chronic Liver Disease and Cirrhosis	.018	.009
Suicide	.014	.005
All Other Causes	.126	.123
Total	1.000	1.000

The 1979 through 1981 data would indicate that 87.4 percent of all males and 87.7 percent of all females in Michigan will die from one of the ten leading causes if all things remain constant. Approximately four of every ten people will die from heart disease. Women face higher risks of death from heart disease, cerebrovascular disease, pneumonia and influenza, diabetes mellitus, and atherosclerosis than do males. At the same time, males are more likely to die from cancer, accidents, chronic obstructive pulmonary diseases and allied conditions, chronic liver disease and cirrhosis, and suicide.

Related to the probability at birth of eventual death due to a given cause is the hypothetical gain in life expectancy that would result if a given cause of death were eliminated. Based on 1979-1981 mortality data, the average number of years of life gained by eliminating deaths due to a major cause is given in the table that follows. Deaths in infancy from all causes are added for comparative purposes.

DISEASE CATEGORY ELIMINATED	YEARS GAINED IN LIFE EXPECTANCY FOR:	
	Males	Females
Diseases of the Heart	4.94	3.37
Malignant Neoplasms	2.72	2.72
Cerebrovascular Diseases	0.57	0.75
Accidents and Adverse Effects	1.27	0.59
Chronic Obstructive Pulmonary Diseases and Allied Conditions	0.35	0.19
Pneumonia and Influenza	0.19	0.16
Diabetes Mellitus	0.16	0.24
Atherosclerosis	0.07	0.08
Chronic Liver Disease and Cirrhosis	0.35	0.21
Suicide	0.39	0.15
All Causes of Infant Mortality	1.01	0.88

The largest gains in life expectancy would result from the elimination of heart disease and cancer, the two leading causes of death. Considering the number of deaths involved, relatively large gains in life expectancy would result from the elimination of infant mortality, accidents, and suicide. Eliminating deaths in the younger age groups, where many of the deaths from these causes occur, has a greater impact on the potential number of years of life to be gained than eliminating deaths in the older age groups.

INFANT DEATHS

Of the 75,818 deaths occurring to Michigan residents in 1981, 1,851 occurred to individuals less than one year of age. The number of infant deaths declined steadily each year from 1958 through 1980, with the single exception of 1970. In 1981 the number of infant deaths was the same as in 1980. The frequency of infant deaths has declined by 47.0 percent since 1970 when there were 3,492 such deaths (Table 2.52). Nationally, the number of infant deaths in 1981 was 42,700 (provisional). This was 42.8 percent below the number in 1970 and 5.1 percent below the provisional figure for 1980.

The rate of death for infants under the age of one year has dropped considerably since 1900. In that year there were 157.1 infant deaths for every 1,000 live births. This means that about 16 of every 100 infants did not survive their first year. This rate fell below 100 by 1914 (96.8), to less than 70 by 1927 (67.7), and to less than 50 by 1937 (47.8). During the 1940's the Michigan infant death rate declined from 40.6 in 1940 to 28.9 in 1949. Relative declines in rate slowed considerably in the 1950's and 1960's. It was not until 1971 that the rate dropped below 20 to 19.5. The rate of decline between 1970 and 1980 compares favorably with the rate of decline observed before 1950. In 1981, the Michigan infant mortality rate was 13.2 (Figure 2.49). This increase of 3.1 percent from the 1980 rate is the largest relative increase in the infant death rate since World War II.

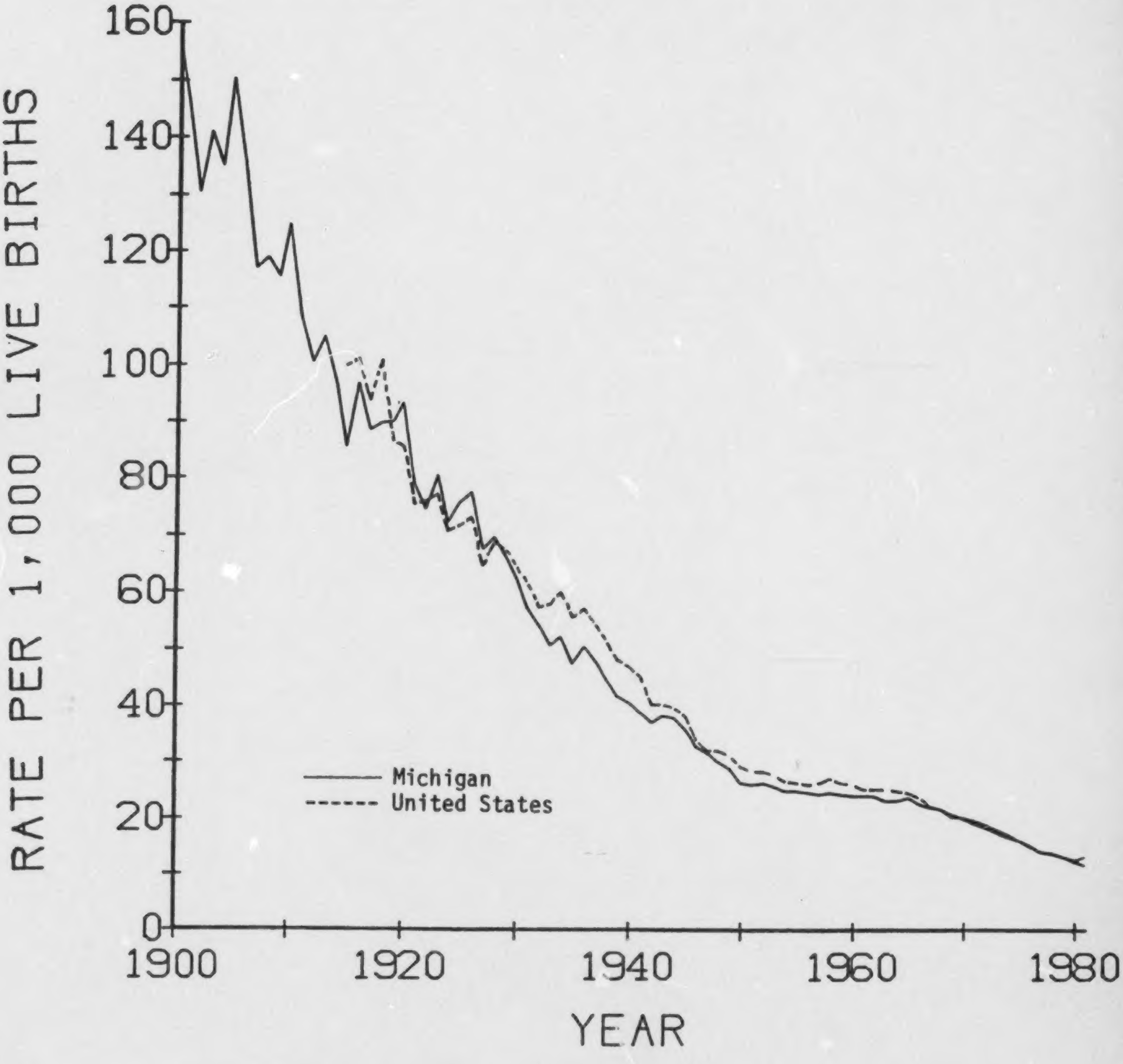
During the period 1915-1928, the rate for Michigan was above that for the United States 9 of 14 years. From 1929 through 1969, Michigan's infant death rate was consistently below the national statistic. From 1970 through 1975 the infant mortality rate in Michigan was slightly higher than the rate for the nation. From 1976 through 1980 the rates for the state and nation were similar. The provisional rate for the United States in 1981 was 11.7. This is 11.4 percent below the rate for Michigan.

Table 2.53 shows the numbers of infant deaths and infant death rates by age at death for the period 1970-1981. The number of infants that died during the first day of life in 1981 (815) is greater than the number of deaths of infants aged 7-364 days (740). 69.2 percent of all infant deaths occurred within the first month of life in 1981, and 60.2 percent occurred in the first week. These percentages were 76.8 and 70.5 percent in 1970. A review of Table 2.53 reveals that the 35.3 percent decline in the infant mortality rate since 1970 stems largely from reductions in the rate of death for those less than 7 days of age. The death rate for infants during their first day of life has declined 27.1 percent since 1970, while the death rate for

Table 2.52
Infant Deaths and Infant Mortality Rates, Michigan and United States Residents, 1970-1981

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
74,667	20.0	1970	3,492	20.3
67,981	19.1	1971	3,157	19.5
60,182	18.5	1972	2,801	19.1
55,581	17.7	1973	2,561	18.1
52,776	16.7	1974	2,387	17.4
50,525	16.1	1975	2,205	16.5
48,265	15.2	1976	1,978	15.1
46,975	14.1	1977	1,945	14.1
45,945	13.8	1978	1,931	13.9
45,665	13.1	1979	1,921	13.3
45,000Pr.	12.5Pr.	1980	1,851	12.8
42,700Pr.	11.7Pr.	1981	1,851	13.2

FIGURE 2.49 INFANT MORTALITY RATES, MICHIGAN RESIDENTS 1900-1981 AND UNITED STATES RESIDENTS,[1] 1915-1981



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[1] United States rates for 1980 and 1981 are provisional.

Table 2.53
Infant Deaths and Mortality Rates by Age at Death, Michigan Residents, 1970-1981

YEAR	AGE AT DEATH									
	TOTAL INFANT DEATHS		UNDER 1 DAY		1-6 DAYS		7-27 DAYS		28-364 DAYS	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
1970	3,492	20.34	1,367	7.96	1,095	6.38	221	1.29	809	4.71
1971	3,157	19.46	1,191	7.34	1,025	6.32	196	1.21	745	4.59
1972	2,801	19.07	1,024	6.97	906	6.17	185	1.26	686	4.67
1973	2,561	18.09	1,131	7.99	579	4.09	192	1.36	659	4.66
1974	2,387	17.37	940	6.84	569	4.14	225	1.64	653	4.75
1975	2,205	16.46	856	6.39	461	3.44	246	1.84	642	4.79
1976	1,978	15.06	829	6.31	402	3.06	193	1.47	554	4.22
1977	1,945	14.05	794	5.74	374	2.70	199	1.44	578	4.18
1978	1,931	13.91	717	5.17	384	2.77	180	1.30	650	4.68
1979	1,921	13.30	754	5.22	356	2.46	185	1.28	626	4.33
1980	1,851	12.75	790	5.44	310	2.14	184	1.27	567	3.91
1981	1,851	13.17	815	5.80	296	2.11	170	1.21	570	4.05

ages 1-6 days has declined by 66.9 percent over the last eleven years. In contrast, the death rate for infants aged 7-27 days actually increased in the mid-1970's before dropping to about the 1970 level. The death rate for infants aged 28-364 days was quite stable from 1970 through 1975. This rate fell in 1976 and 1977 but increased in 1978 to about the same level as observed in 1970. The death rate for this age group has declined since 1978. In 1981 the death rate for infants aged 28-364 days was 4.05, 14.0 percent below the comparable rate for 1970. The increase in the infant death rate between 1980 and 1981 was largely due to the increase of 6.6 percent in the death rate for infants under one day old.

Infant mortality rates have varied considerably by race. Rates for white and other than white infants since 1950 are graphically displayed in Figure 2.50. Rates for other than white infants were higher throughout the period. Although the rates for both race groups have declined, those for white infants have decreased by a relatively larger amount. As a result, the racial differential in infant mortality rates has increased since 1950. Between 1950 and 1965, the infant mortality rate for white infants declined moderately while that for other than white infants remained relatively stable. Between 1965 and 1970 the rate for white infants declined by 14.7 percent while the rate for other than white infants declined by 20.5 percent. Since 1970, however, the rate for white infants has dropped by 41.1 percent while for other than white infants the decline was 20.1 percent. The rate for other than white infants of 35.6 in 1950[2] was 40.2 percent higher than that for white infants (25.4) whereas in 1981 the rate for other than white infants of 23.8 was 2.2 times that for white infants (10.9). Between 1980 and 1981 the increases in the infant death rate for white and other than white infants were similar (3.8 percent and 3.0 percent, respectively).

Michigan resident infant deaths in 1981 are listed by cause of death classification and age at death in Table 2.54. Congenital anomalies caused the death of 322 infants and was the specific disease category most frequently reported. Sudden infant death syndrome was responsible for 268 infant deaths in 1981, while respiratory distress syndrome was listed as the cause of 192 deaths. Over half (55.2 percent) of all infant deaths were attributed to conditions originating in the perinatal period. This proportion was 84.5 percent for deaths which occurred during the first day, 67.6 percent for deaths of infants at ages 1 through 6 days, and 53.5 percent for deaths of infants 1-3 weeks of age. In contrast, 23 of 452 deaths (5.1 percent)

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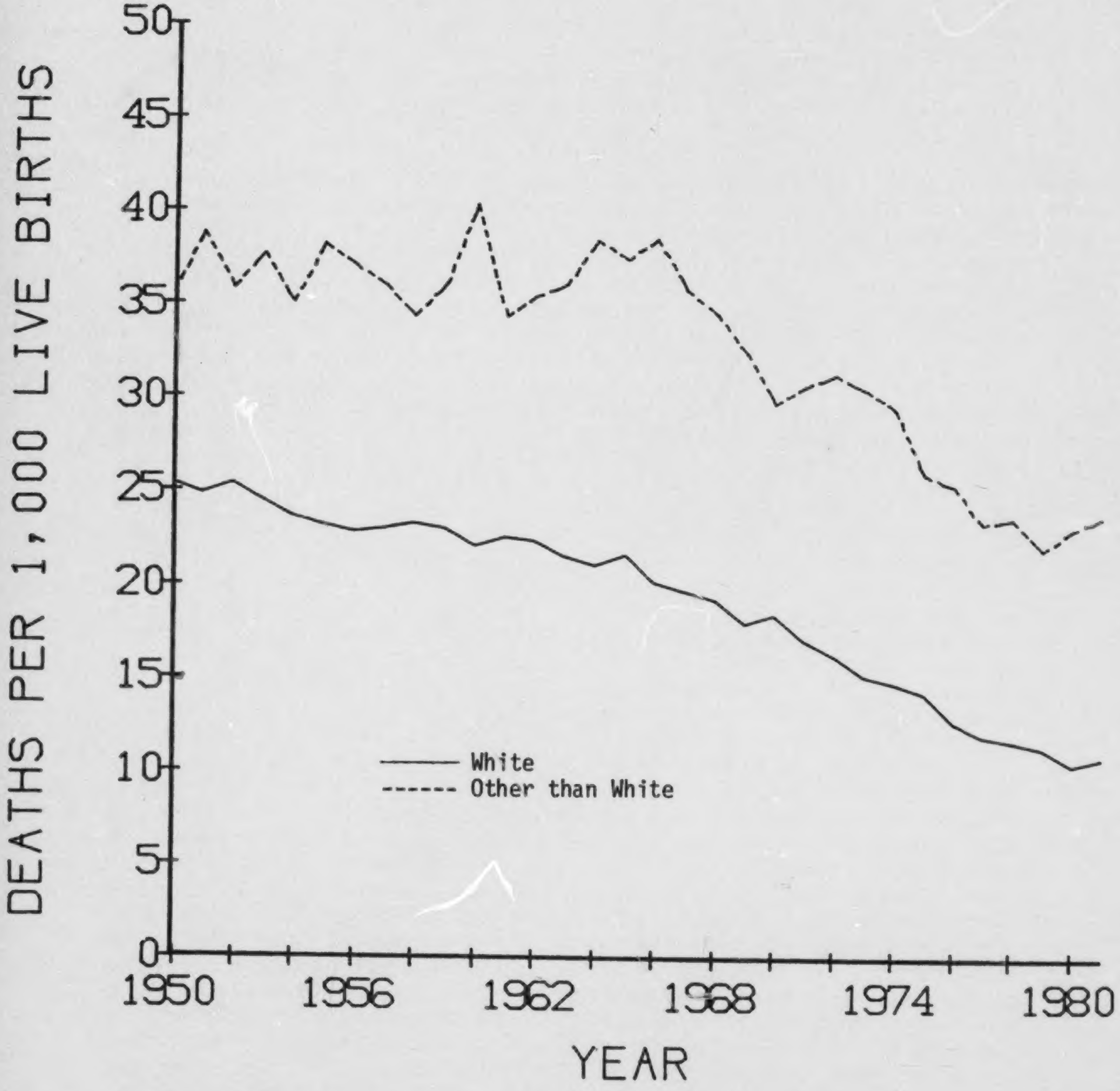
[2] Rates for other than white infants for 1950-1969 are based on deaths of unknown race as well as deaths of races other than white.

FIGURE 2.50 INFANT DEATH RATES BY RACE[1],
MICHIGAN RESIDENTS, 1950-1981



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[1] Other than white rates for 1950-1969 are based on deaths of unknown race as well as deaths of races other than white.

Table 2.54
Infant Deaths by Age at Death and Underlying Cause, Michigan Residents, 1981

ICD - 9 CODE	CAUSE OF DEATH	AGE AT DEATH					
		TOTAL UNDER 1 YEAR	UNDER 1 DAY	1-6 DAYS	7-27 DAYS	1-5 MONTHS	6-11 MONTHS
8, 9, 535, 555-558	Certain gastrointestinal diseases	6	-	-	1	5	-
38	Septicemia	5	-	-	-	4	1
1-7, 10-37, 39-139	Remainder of infectious and parasitic diseases	3	-	-	-	1	2
320-322	Meningitis	16	1	-	6	4	5
480-487	Pneumonia and influenza	16	-	-	1	11	4
740-759	Congenital anomalies	322	114	76	37	71	24
761	Newborn affected by maternal complications of pregnancy	89	80	7	-	2	-
762	Newborn affected by complications of placenta, cord and membranes	39	36	3	-	-	-
765	Disorders relating to short gestation and unspecified low birthweight	168	160	4	3	-	1
767	Birth trauma	30	6	17	6	1	-
768	Intrauterine hypoxia and birth asphyxia	74	56	13	4	1	-
769	Respiratory distress syndrome	192	92	69	21	8	2
770	Other respiratory conditions of newborn	172	95	39	18	5	15
771	Infections specific to the perinatal period	30	10	12	8	-	-
772	Neonatal hemorrhage	25	-	15	10	-	-
760, 763, 764, 766, 773-779	All other and ill-defined conditions originating in the perinatal period	202	154	21	21	6	-
760-779	Certain conditions originating in the perinatal period	1,021	689	200	91	23	18
798.0	Sudden infant death syndrome	268	-	2	22	228	16
E800-E949	Accidents and adverse effects	41	-	-	-	23	18
E960-E969	Homicide	7	3	-	-	3	1
Residual	All other causes	146	8	18	12	79	29
	Total	1,951	815	296	170	452	118

of infants from 1-5 months of age were caused by conditions originating in the perinatal period.

The most frequent cause of death category during the first day was disorders relating to short gestation and unspecified low birthweight (19.6 percent). Congenital anomalies were responsible for 14.0 percent of the deaths during the first day of life. Respiratory distress syndrome and other respiratory conditions of the newborn caused 11.3 percent and 11.7 percent respectively of the deaths under 1 day of age. Congenital anomalies and respiratory distress syndrome were the leading causes of death for infants 1-6 days of age (25.7 percent and 23.3 percent respectively). For infants who died at 1-3 weeks of age the most frequent causes were congenital anomalies (21.8 percent) and sudden infant death syndrome (12.9 percent). Sudden infant death syndrome was reported as the cause of 50.4 percent of the deaths to infants from 1-5 months of age. The leading cause of death for infants from 6-11 months of age was congenital anomalies (20.3 percent). The 18 deaths due to accidents to infants aged 6-11 months represent 15.3 percent of the total deaths in this age group, while accidental deaths represent only 2.2 percent of all infant deaths.

Infant deaths and death rates by cause are shown for white and other than white infants in Table 2.55. The most frequent causes of death for white infants were congenital anomalies (263 deaths), sudden infant death syndrome (177 deaths), and respiratory distress syndrome (134 deaths). For other than white infants sudden infant death syndrome was the leading cause (91 deaths), followed by disorders relating to short gestation and unspecified low birthweight and congenital anomalies (69 and 58 deaths respectively). While the death rate from all causes combined for other than white infants was 2.2 times that for white infants, the rate for deaths due to certain conditions originating in the perinatal period for other than white infants was 2.7 times that for white infants. Note that 15.6 percent of the deaths of other than white infants were attributed to "all other and ill-defined conditions originating in the perinatal period", compared to 8.8 percent of the deaths of white infants. Rates for other than white infants were between 3 and 4 times those for white infants for deaths due to maternal complications of pregnancy, disorders relating to short gestation and unspecified low birthweight, birth trauma, and all other and ill-defined conditions originating in the perinatal period. Cause-specific infant death rates for other than white infants were higher for all categories with sufficient events to calculate rates for both groups. The smallest relative differentials were in the categories of congenital anomalies and pneumonia and influenza, where the death rates for other than white infants exceeded those for white infants by 4 percent and 15 percent respectively.

Table 2.55
Infant Deaths and Infant Death Rates by Race of Infant and Underlying Cause, Michigan Residents, 1981

ICD - 9 CODE	CAUSE OF DEATH	RACE OF INFANT					
		TOTAL[1]		WHITE		OTHER THAN WHITE	
		NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]
8, 9, 535, 555-558	Certain gastrointestinal diseases	6	4.3	2	*	4	*
38	Septicemia	5	3.6	3	*	2	*
1-7, 10-37, 39-139	Remainder of infectious and parasitic diseases	3	*	3	*	-	*
320-322	Meningitis	16	11.4	13	11.2	3	*
480-487	Pneumonia and influenza	16	11.4	11	9.5	5	20.4
740-759	Congenital anomalies	322	229.1	263	226.8	58	236.7
761	Newborn affected by maternal complications of pregnancy	89	63.3	48	41.4	40	163.2
762	Newborn affected by complications of placenta, cord and membranes	39	27.7	30	25.9	9	36.7
765	Disorders relating to short gestation and unspecified low birthweight	168	119.5	99	85.4	69	281.6
767	Birth trauma	30	21.3	17	14.7	13	53.1
768	Intrauterine hypoxia and birth asphyxia	74	52.6	47	40.5	26	106.1
769	Respiratory distress syndrome	192	136.6	134	115.5	55	224.5
770	Other respiratory conditions of newborn	172	122.4	128	110.4	44	179.6
771	Infections specific to the perinatal period	30	21.3	19	16.4	11	44.9
772	Neonatal hemorrhage	25	17.8	17	14.7	8	32.6
760, 763, 764, 766, 773-779	All other and ill-defined conditions originating in the perinatal period	202	143.7	111	95.7	91	371.4
760-779	Certain conditions originating in the perinatal period	1,021	726.3	650	560.5	366	1,493.7
798.0	Sudden infant death syndrome	268	190.6	177	152.6	91	371.4
E800-E949	Accidents and adverse effects	41	29.2	30	25.9	11	44.9
E960-E969	Homicide	7	5.0	4	*	3	*
Residual	All other causes	146	103.9	105	90.5	39	159.2
	Total	1,851	1,316.7	1,261	1,087.3	582	2,375.2

[1] Records with race not stated are included only in total columns.

[2] Rates per 100,000 live births.

The infant death rate from all causes for males was 23 percent greater than that for females. The differential for deaths due to certain conditions originating in the perinatal period was 28 percent. The largest relative differentials in rates by sex were for respiratory distress syndrome and neonatal hemorrhage, where the rates for males were 1.6 and 2.0 times those for females, respectively. The only causes for which the rates were higher for females were pneumonia and influenza, birth trauma, and infections specific to the perinatal period (Table 2.56).

Infant mortality rates by race are presented in Table 2.57. These data are from a file of merged live birth and infant death information. The rates presented are for Michigan residents born in 1980. Note that this matched file is approximately 98.7 percent complete and, therefore, the rates presented are understated. The rates for black infants (23.4) and American Indian infants (18.7) were 2.3 and 1.8 times respectively that for white infants (10.3). The rate for infants of other races (7.9) was well below the rate for all infants. The death rate for infants aged less than seven days showed similar variations by race (Table 2.58).

Data from the matched file on infant mortality rates by age of mother and race of child are presented in Table 2.59. Infant death rates display a parabolic relationship with mother's age. The rates are highest for infants born to mothers under age 20. The infant mortality rates of 39.3 and 18.0 for mothers under 15 years old and 15-19 years old respectively are 3.9 times and 1.8 times as high as the rate of 10.2 for mothers aged 25-29 years. The infant mortality rate for mothers 40 or over is about 37 percent higher than that for mothers of all ages combined.

Rates for white infants generally follow the pattern of association to mother's age, but infant mortality rates for the other than white group are less variable and are significantly above those for the white group in all categories with a sufficient number of events to calculate rates. The smallest differential was for mothers from 15-19 years of age where the rate for other than white infants was 1.6 times that of white infants. Overall the rate for other than white infants was more than twice as high as that for white infants.

Table 2.60 displays the variation in infant death rates according to the number of the mother's prenatal visits. The infant death rate for mothers who had no prenatal care was 72.5, over thirteen times as high as the low rate of 5.5 for mothers who had 15-19 prenatal visits. The rate associated with mothers who had 1-4 visits was 11.9 times the low rate, while the rate associated with mothers who had 5-9 visits was 3.6 times as high as the low rate. The

Table 2.56
Infant Deaths and Infant Death Rates by Sex of Infant and Underlying Cause, Michigan Residents, 1981

ICD - 9 CODE	CAUSE OF DEATH	SEX OF INFANT					
		TOTAL[1]		MALE		FEMALE	
		NUMBER	RATE[2]	NUMBER	RATE[2]	NUMBER	RATE[2]
8, 9, 535, 555-558	Certain gastrointestinal diseases	6	4.3	2	*	4	*
38	Septicemia	5	3.6	1	*	4	*
1-7, 10-37, 39-139	Remainder of infectious and parasitic diseases	3	*	1	*	2	*
320-322	Meningitis	16	11.4	13	18.1	3	*
480-487	Pneumonia and influenza	16	11.4	7	9.7	9	13.1
740-759	Congenital anomalies	322	229.1	167	232.2	149	217.1
761	Newborn affected by maternal complications of pregnancy	89	63.3	52	72.3	37	53.9
762	Newborn affected by complications of placenta, cord and membranes	39	27.7	23	32.0	16	23.3
765	Disorders relating to short gestation and unspecified low birthweight	168	119.5	98	136.2	70	102.0
767	Birth trauma	30	21.3	13	18.1	17	24.8
768	Intrauterine hypoxia and birth asphyxia	74	52.6	39	54.2	35	51.0
769	Respiratory distress syndrome	192	136.6	120	166.8	71	103.4
770	Other respiratory conditions of newborn	172	122.4	101	140.4	71	103.4
771	Infections specific to the perinatal period	30	21.3	13	18.1	17	24.8
772	Neonatal hemorrhage	25	17.8	17	23.6	8	11.7
760, 763, 764, 766, 773-779	All other and ill-defined conditions originating in the perinatal period	202	143.7	109	151.5	93	135.5
760-779	Certain conditions originating in the perinatal period	1,021	726.3	585	813.2	435	633.7
798.0	Sudden infant death syndrome	268	190.6	156	216.9	112	163.2
E800-E949	Accidents and adverse effects	41	29.2	22	30.6	19	27.7
E960-E969	Homicide	7	5.0	4	*	3	*
Residual	All other causes	146	103.9	79	109.8	67	97.6
	Total	1,851	1,316.7	1,037	1,441.6	807	1,175.7

[1] Records with sex not stated are included only in total column.
[2] Rates per 100,000 live births.

Table 2.57
Infant Deaths, Live Births, and Infant Death Rates by Race, Michigan Resident Infants Born in 1980

RACE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE
All Races	1,821	145,162	12.5
White	1,232	119,103	10.3
Black	564	24,127	23.4
American Indian	9	481	18.7
Other Races	10	1,262	7.9
Unknown	6	189	31.7

Table 2.58
Hebdomadal Deaths[1] and Death Rates[2] by Race, Michigan Resident Infants Born in 1980

RACE	HEBDOMADAL DEATHS	HEBDOMADAL DEATH RATE
All Races	1,089	7.5
White	710	6.0
Black	366	15.2
American Indian	5	10.4
Other Races	4	*
Unknown	4	*

[1] Deaths to infants less than seven days old.
[2] Per 1,000 live births.

Table 2.59
Infant Deaths, Live Births, and Infant Death Rates by Age of Mother and Race[1] of Infant, Michigan Resident Infants Born in 1980

AGE OF MOTHER	ALL INFANTS			WHITE INFANTS			ALL OTHER INFANTS		
	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE
All Ages	1,821	145,162	12.5	1,232	119,103	10.3	583	25,870	22.5
Under 15 Years	13	331	39.3	3	108	*	10	223	44.8
15-19 Years	360	20,000	18.0	216	14,082	15.3	142	5,904	24.1
20-24 Years	666	51,218	13.0	454	42,244	10.7	211	8,902	23.7
25-29 Years	481	47,113	10.2	359	40,447	8.9	122	6,609	18.5
30-39 Years	283	25,716	11.0	189	21,600	8.8	93	4,071	22.8
40 or More Years	13	762	17.1	10	601	16.6	3	161	*
Age Not Stated	5	22	227.3	1	21	*	2[2]	-	*

[1] Race not stated included in total columns only.

[2] The inconsistency of more infant deaths than live births is due to delayed birth records which were included on the matched infant death file but not on the live birth file.

Table 2.60
Infant Deaths, Live Births, and Infant Death Rates by Prenatal Visits and Race of Infant, Michigan Resident Infants Born in 1980

NUMBER OF VISITS	ALL INFANTS			WHITE INFANTS			ALL OTHER INFANTS[1]		
	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE	INFANT DEATHS	LIVE BIRTHS	INFANT DEATH RATE
Total	1,821	145,162	12.5	1,232	119,103	10.3	583	25,870	22.5
0	68	938	72.5	26	496	52.4	41	441	93.0
1-4	332	5,074	65.4	200	3,076	65.0	132	1,995	66.2
5-9	617	31,120	19.8	447	24,492	18.3	170	6,604	25.7
10-14	501	86,051	5.8	387	74,785	5.2	114	11,233	10.1
15-19	74	13,343	5.5	58	11,213	5.2	16	2,126	7.5
20 or Over	24	2,541	9.4	18	1,909	9.4	6	631	9.5
Unknown	205	6,095	33.6	96	3,132	30.7	104	2,840	36.6

[1] Race not stated included in total columns only.

infant death rate for mothers with 20 or more prenatal visits was 71 percent higher than the low rate, reflecting the likelihood that a high number of prenatal visits is connected with a problem pregnancy.

Mothers with fewer than ten prenatal visits had 25.6 percent of all live births but 55.8 percent of all infant deaths. Mothers who had ten or more prenatal visits had 70.2 percent of the live births and 32.9 percent of the infant deaths. The infant death rate for mothers who had fewer than ten prenatal visits was 27.4. This is 4.6 times the rate of 5.9 for mothers who had ten or more prenatal visits.

The differential in mortality rates between other than white and white infants noted above is significantly altered when comparisons are made within the same range of prenatal visits. While the overall rate for other than white infants was 2.2 times that for white infants, for mothers who had 1-4 prenatal visits or 20 or more prenatal visits the rates for other than white infants were similar to the rates for white infants. For mothers with fewer than ten prenatal visits, the infant mortality rate for white infants was 24.0 and that for other than white infants 37.9. For mothers with ten or more prenatal visits, the rate for white infants was 5.3 and for other than white infants 9.7. The rate for other than white infants was 58 percent higher where the mother had fewer than ten prenatal visits and 83 percent higher where the mother had ten or more visits. Both of these racial differentials were less than the overall racial differential of 118 percent. This seemingly paradoxical result is explained by the differing distributions of the white and the other than white births. The overall infant mortality rate for each race is a weighted sum of the infant mortality rates for the different prenatal care categories. The weight for each prenatal care category is the ratio of the number of live births in that category to the total number of live births. Since a greater proportion of the other than white live births are to mothers in the categories with fewer prenatal visits, the higher infant mortality rates in the categories with fewer prenatal visits are more heavily weighted for the other than white population.

When deaths under one week are added to fetal deaths the total is called perinatal deaths. By placing a ceiling of six days for the infant component of perinatal deaths, most accidental and environmental causes of death are eliminated. In 1981, Michigan resident perinatal deaths numbered 2,194 and the perinatal death rate was 15.5. This rate was 15.6 in 1980 and 26.0 in 1970. As with infant death rates, perinatal death rates vary considerably with race, age of mother, and number of prenatal visits. Tables 2.61 and 2.62 show perinatal deaths and rates by age of

Table 2.61

Perinatal Deaths, Total Births, and Perinatal Death Rates by Age of Mother and Race[1] of Infant or Fetus, Births to Michigan Residents in 1980

AGE OF MOTHER	ALL RACES			WHITE			ALL OTHER		
	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE
Total	2,265	146,338	15.5	1,543	119,936	12.9	698	26,193	26.6
Under 15 Years	17	339	50.1	8	113	70.8	9	226	39.8
15-19 Years	379	20,186	18.8	215	14,191	15.2	160	5,979	26.8
20-24 Years	768	51,592	14.9	530	42,517	12.5	232	8,998	25.8
25-29 Years	636	47,463	13.4	470	40,704	11.5	162	6,698	24.2
30-39 Years	420	25,940	16.2	293	21,769	13.5	126	4,125	30.5
40 or More Years	21	774	27.1	17	611	27.8	4	163	*
Age Not Stated	24	44	000	10	31	000	5[2]	4	000

[1] Race not stated included in total columns only.

[2] The inconsistency of more perinatal deaths than total births is due to a delayed birth record which was included on the matched infant death file but not on the live birth file.

Table 2.62
Perinatal Deaths, Total Births, and Perinatal Death Rates by Prenatal Visits and Race[1] of Infant or Fetus, Births to Michigan Residents in 1980

NUMBER OF VISITS	ALL RACES			WHITE			ALL OTHER		
	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE	PERINATAL DEATHS	TOTAL BIRTHS	PERINATAL DEATH RATE
Total	2,265	146,338	15.5	1,543	119,936	12.9	698	26,193	26.6
0	96	991	96.9	43	521	82.5	52	469	110.9
1-4	426	5,259	81.0	254	3,189	79.6	169	2,064	81.9
5-9	770	31,510	24.4	576	24,798	23.2	189	6,683	28.3
10-14	502	86,321	5.8	400	75,011	5.3	99	11,274	8.8
15-19	88	13,392	6.6	70	11,253	6.2	17	2,134	8.0
20 or Over	31	2,563	12.1	25	1,926	13.0	6	636	9.4
Unknown	352	6,302	000	175	3,238	000	166	2,933	000

[1] Race not stated included in total columns only.

mother, the number of the mother's prenatal visits, and the race of the fetus or infant for fetal deaths and live births occurring in 1980. The data for hebdomadal deaths are drawn from a merged file of birth and death data. As a result, perinatal deaths and rates are slightly understated. Table 2.61 makes clear the increased risk of death to fetuses and infants of mothers under 20 years or age 40 or greater. Minimum risk in 1980 was associated with mothers 25-29 years of age. Table 2.62 indicates that the risk of perinatal death is more than twelve times as great for fetuses and infants whose mothers had fewer than five prenatal visits compared to those whose mothers had ten or more visits. The risk associated with 5-9 prenatal visits is 4.2 times as great as for the lowest risk category (10-14 visits).

The overall perinatal mortality rate for other than white fetuses and infants was twice as high as for whites. The highest perinatal death rate for both groups was associated with mothers under age 15. The minimum risk was associated with mothers 25-29 years of age for both white and other than white fetuses and infants (Table 2.61).

For both white and other than white fetuses and infants the highest mortality rates were associated with mothers who received less than 5 prenatal visits. For those born to mothers who received 20 or more prenatal visits the rate was higher for white fetuses and infants than for other than white fetuses and infants. In each of the other prenatal care categories the rates were higher for other than white fetuses and infants, although the differentials by race were considerably less than the overall differential (Table 2.62).

The median birth weight of infants born in 1980 and dying prior to 1 year of age was 1,510 grams (Table 2.63). The median birth weight of all Michigan resident live births in 1980 was 3,380 grams. For all maternal age groups, the median birth weight for infant deaths was below the overall median birth weight for liveborn infants.

Infant death rates by race, birth weight and age at death are displayed in Table 2.64 for infants born in 1980. While the overall infant death rate for other than white infants was more than double that of white infants, the rates for white and other than white infants were quite similar for infants born weighing 1500 grams or less. The rate for white infants weighing 1501-2500 grams exceeded by 35 percent the comparable rate for other than white infants. For infants weighing 2,501 grams or more the rate for other than white infants exceeded by 60 percent that for white infants. A large part of the difference between infant death rates for white and other than white infants is due to the fact that a greater proportion of the other than white infants were born at weights below 2,501 grams (12.5 percent

Table 2.63
Infant Deaths by Birth Weight and Mother's Age, Michigan Resident Infants Born in 1980

BIRTH WEIGHT IN GRAMS	TOTAL	MOTHER'S AGE						
		UNDER 15	15-19	20-24	25-29	30-39	40 OR MORE	NOT STATED
Total	1,321	13	360	666	481	283	13	5
500 or Less	206	2	33	86	44	40	1	-
501-1,000	475	6	99	170	132	67	1	-
1,001-1,500	177	1	33	70	43	28	1	1
1,501-2,000	115	1	29	39	24	20	2	-
2,001-2,500	130	1	32	50	28	18	1	-
2,501-3,000	209	1	43	78	59	27	1	-
3,001-3,500	226	-	50	77	65	30	4	-
3,501-4,000	147	1	23	52	47	23	1	-
4,001-4,500	40	-	4	17	10	9	-	-
4,501 and Over	14	-	2	4	4	4	-	-
Not Stated	82	-	12	23	25	17	1	4
Median Weight in Grams	1,510	*	1,644	1,446	1,700	1,474	*	*

Table 2.64
Live Births by Birthweight and Race of Infant and Infant Deaths and Infant Death Rates by Birthweight, Age at Death, and Race of Infant, Michigan Resident Infants Born in 1980

BIRTHWEIGHT	RACE OF INFANT	LIVE BIRTHS	AGE AT DEATH					
			UNDER 1 YEAR		UNDER 28 DAYS		28-364 DAYS	
			NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
Total	All Races	145,162	1,821	12.5	1,271	8.8	550	3.8
	White	119,103	1,232	10.3	846	7.1	386	3.2
	All Other[1]	25,870	583	22.5	421	16.3	162	6.3
Less Than 1501 Grams	All Races	1,849	858	464.0	790	427.3	68	36.8
	White	1,163	536	460.9	497	427.3	39	33.5
	All Other[1]	680	319	469.1	290	426.5	29	42.6
1501-2500 Grams	All Races	8,148	245	30.1	149	18.3	96	11.8
	White	5,586	183	32.8	123	22.0	60	10.7
	All Other[1]	2,549	62	24.3	26	10.2	36	14.1
2501 Grams Or Greater	All Races	134,769	636	4.7	262	1.9	374	2.8
	White	112,225	481	4.3	199	1.8	282	2.5
	All Other[1]	22,396	155	6.9	63	2.8	92	4.1
Unknown Birthweight	All Races	396	82	207.0	70	17.7	12	30.3
	White	129	32	248.1	27	209.3	5	38.8
	All Other[1]	245	47	191.8	42	171.4	5	20.4

[1] Race not stated included in total rows only.

for other than white infants compared to 5.7 percent for white infants).

The differentials in death rates by race for deaths under 28 days (neonatal deaths) and from 28-364 days (postneonatal deaths) were similar to that for all infant deaths. For both neonatal and postneonatal deaths the differentials in death rates by race in the different birth weight categories were less than the overall differential. For infants weighing less than 1,501 grams the rates for deaths before 28 days were similar for white and other than white infants while the rate for deaths from 28-364 days was greater for other than white infants. The neonatal rate for white infants weighing 1501-2500 grams was more than twice the comparable rate for other than white infants while the postneonatal death rate for other than white infants in this birth weight category exceeded the comparable rate for white infants by 32 percent. For infants weighing 2501 grams or more at birth, the rates were higher for other than white infants by 56 percent and 64 percent, respectively, for neonatal and postneonatal deaths. It is interesting to note that although the death rates for white infants under 28 days of age were greater than those for other than white infants in both of the low weight categories examined, the rate for all low weight infants (2500 grams or less) who died before 28 days was greater for other than white infants (97.9 compared to 91.9). This is the result of a greater proportion of other than white infants born at weights under 1,501 grams where the infant death rates are much higher.

COMMUNICABLE DISEASE DEATHS

Although comprising a smaller proportion of deaths than they have in the past, communicable disease deaths continue to be a public health concern. In 1981, deaths from all infectious and parasitic diseases numbered 685. As can be observed from Table 2.65, nearly two thirds of these deaths were caused by septicemia (443 deaths). Tuberculosis, viral hepatitis, and mycoses caused 53, 35, and 28 deaths, respectively. When deaths attributed to late effects of tuberculosis are included, the number of deaths from tuberculosis rises to 65.

The distribution of infectious and parasitic disease deaths by age, race, and sex for 1981 is given in Table 2.66, and the corresponding death rates are shown in Table 2.67. Note that deaths to other than white persons accounted for 21.5 percent of all infectious and parasitic disease deaths but only 13.4 percent of deaths from all causes. The death rates were highest for persons aged 65 years and over (46.2 deaths per 100,000 population) and for infants under 1 year (8.5). Rates for other than white males were highest, followed by those for other than white females.

Deaths due to such diseases as diptheria, scarlet fever, streptococcal sore throat, small pox, typhoid fever, measles, poliomyelitus and others have been virtually eliminated not only in Michigan, but across the nation. Table 4.7 illustrates trends in deaths from the major communicable diseases.

Table 2.65
Deaths From Selected Infectious and Parasitic Diseases, Michigan Residents, 1981

ICD LIST[1] NUMBER	CAUSE OF DEATH	FREQUENCY
038	Septicemia	443
010-018	Tuberculosis	53
070	Viral Hepatitis	35
110-118	Mycoses	28
137	Late Effects of Tuberculosis	12
046	Slow Virus Infection of Central Nervous System	12
036	Meningococcal Infection	12
135	Sarcoidosis	10
054	Herpes Simplex	6
040.0	Gas Gangrene	5
090-097	Syphilis	4
053	Herpes Zoster	3
136.3	Pneumocystosis	3
052	Chickenpox	2
Residual 000-139	All Other Infectious and Parasitic Diseases .	57
000-139	Total	685

[1] Detailed List of the 9th Revision of the International Classification of Diseases, WHO.

Table 2.66
Deaths Due to Infectious and Parasitic Diseases by Age, Race', and Sex, Michigan Residents, 1981

AGE	TOTAL	MALE		FEMALE	
		WHITE	OTHER THAN WHITE	WHITE	OTHER THAN WHITE
All Ages	685	257	85	279	62
Under 1 Year	12	2	2	5	3
1-19 Years	20	10	-	8	2
20-44 Years	66	18	18	16	14
45-64 Years	156	64	25	54	12
65 and Over	431	163	40	196	31

Table 2.67
Infectious and Parasitic Diseases Death Rates by Age, Race', and Sex, Michigan Residents, 1981

AGE	TOTAL	MALE		FEMALE	
		WHITE	OTHER THAN WHITE	WHITE	OTHER THAN WHITE
All Ages	7.4	6.7	12.5	7.0	8.3
Under 1 Year	8.5	*	*	9.1	*
1-19 Years	0.7	0.8	*	0.7	*
20-44 Years	1.9	1.2	7.1	1.1	4.8
45-64 Years	8.7	8.5	24.5	6.7	10.2
65 and Over	46.2	47.7	99.2	39.5	57.3

'The deaths of one male and one female with race not stated are included in the total column only.

INJURY AT WORK

There were 179 deaths reported as resulting from injuries at work in 1981, 6 fewer than in 1980 and 38 fewer than in 1979. These include all cases in which the underlying cause of death was external and the injury was reported to have occurred at work, whether or not the injury was work-related. Table 2.68 gives the frequency of deaths due to injuries at work by place of occurrence. The most common site was industrial places and premises with 57 deaths. Injuries taking place on streets and highways and in public buildings caused 36 deaths each. There were 20 deaths from injuries taking place on farms.

The most frequent causes of death associated with injuries at work were accidents caused by machinery and homicide and legal intervention, each involving 35 deaths or 19.6 percent of all such deaths (Table 2.69). The third most common cause was motor vehicle traffic accidents, accounting for 29 deaths and 16.2 percent of the total. Accidental falls and accidents caused by electric current accounted for 17 and 16 deaths, respectively. Accidents caused by falling objects accounted for 7 injury at work deaths, while air and space transport accidents were the cause of an additional 5 deaths.

Table 2.68
Deaths Due to Injury at Work by Place of Injury, Michigan Residents, 1981

PLACE	NUMBER OF DEATHS
Industrial Place and Premises	57
Street and Highway	36
Public Building	36
Farm	20
Home	9
Place for Recreation and Sport	3
Mine and Quarry	-
Other Specified Places	16
Place Not Specified	2
Total	179

Table 2.69
Deaths Due to Injury at Work by Cause of Death, Michigan Residents, 1981

ICD LIST' NUMBER	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT
E919	Accidents Caused by Machinery	35	19.6
E960-E978	Homicide and Legal Intervention	35	19.6
E810-E819	Motor Vehicle Traffic Accidents	29	16.2
E880-E888	Accidental Falls	17	9.5
E925	Accidents Caused by Electric Current .	16	8.9
E916	Struck Accidentally by Falling Object .	7	3.9
E840-E845	Air and Space Transport Accidents . . .	5	2.8
E923	Accident Caused by Explosive Material .	4	2.2
E820-E825	Motor Vehicle Nontraffic Accidents . .	4	2.2
E890-E899	Accident Caused by Fire and Flames . .	3	1.7
E913	Accidental Mechanical Suffocation . . .	2	1.1
E950-E959	Suicide	2	1.1
E928	Other and Unspecified Environmental and Accidental Causes	2	1.1
E830-E838	Water Transport Accidents	1	0.6
Residual E800-E949	All Other Accidents	17	9.5
	Total	179	100.0

'Detailed List of the 9th Revision of the International Classification of Diseases, WHO.

LIFE EXPECTANCY

The life expectancy of a Michigan resident at birth is 73.6 years, based on 1981 mortality and population data. Females demonstrated a significantly greater longevity than males. In 1981 the life expectancy at birth was 70.2 years for males and 76.9 years for females. This results from the higher mortality rates of males at all ages.

Life expectancies by sex in selected years for Michigan and United States residents are presented in Table 2.70. It can be seen that longevity has increased greatly in Michigan since 1901, by 16.8 years for males and by 21.8 years for females. Females born in Michigan in 1901 could expect to live 1.7 years longer than their male counterparts. By 1950 the differential in life expectancy between the sexes was 5.5 years. This disparity increased to 7.6 years by 1971, remained constant through 1973, and by 1981 had declined to 6.7 years. Between 1971 and 1981 life expectancy for males increased by 2.9 years while for females the increase was 2.0 years.

The life expectancy of Michigan residents was well above that for the nation in 1901, but this differential had virtually disappeared by 1950. In 1979 the life expectancy of males in Michigan was slightly above that for males nationwide, 70.0 years compared to 69.9 years, while longevity for females residing in this state was 0.8 years below the average for the country. Note that females have consistently demonstrated greater longevity than males both in Michigan and in the United States.

White persons displayed a life expectancy 4.8 years greater than other than white persons in 1981. The life expectancy of white males was 5.2 years greater than that of males of other races in 1981 compared to a differential of 5.8 years in 1950 (Table 2.71). In 1970 the differential was 7.2 years, due in part to an actual reduction in life expectancy for other than white males between 1960 and 1970. Since 1970 life expectancy for other than white males has increased 7.9 percent, from 61.0 to 65.8 years. This is a reflection of the recent decline in mortality rates for several leading causes of death for this group. The change in the differentials by race for female expectancies has been much more pronounced. In 1950, Michigan resident white females had an average longevity 8.5 years greater than females of all other races. This disparity declined to 4.1 years in 1981.

The expected number of years of life remaining are presented graphically by age, race, and sex in Figure 2.51. The number of years of life remaining for females is greater than that for males throughout life. At age 60 the differential is 4.4 years for white males and white females,

Table 2.70

Life Expectancy at Birth by Sex, Michigan and United States Residents, Selected Years, 1901-1981

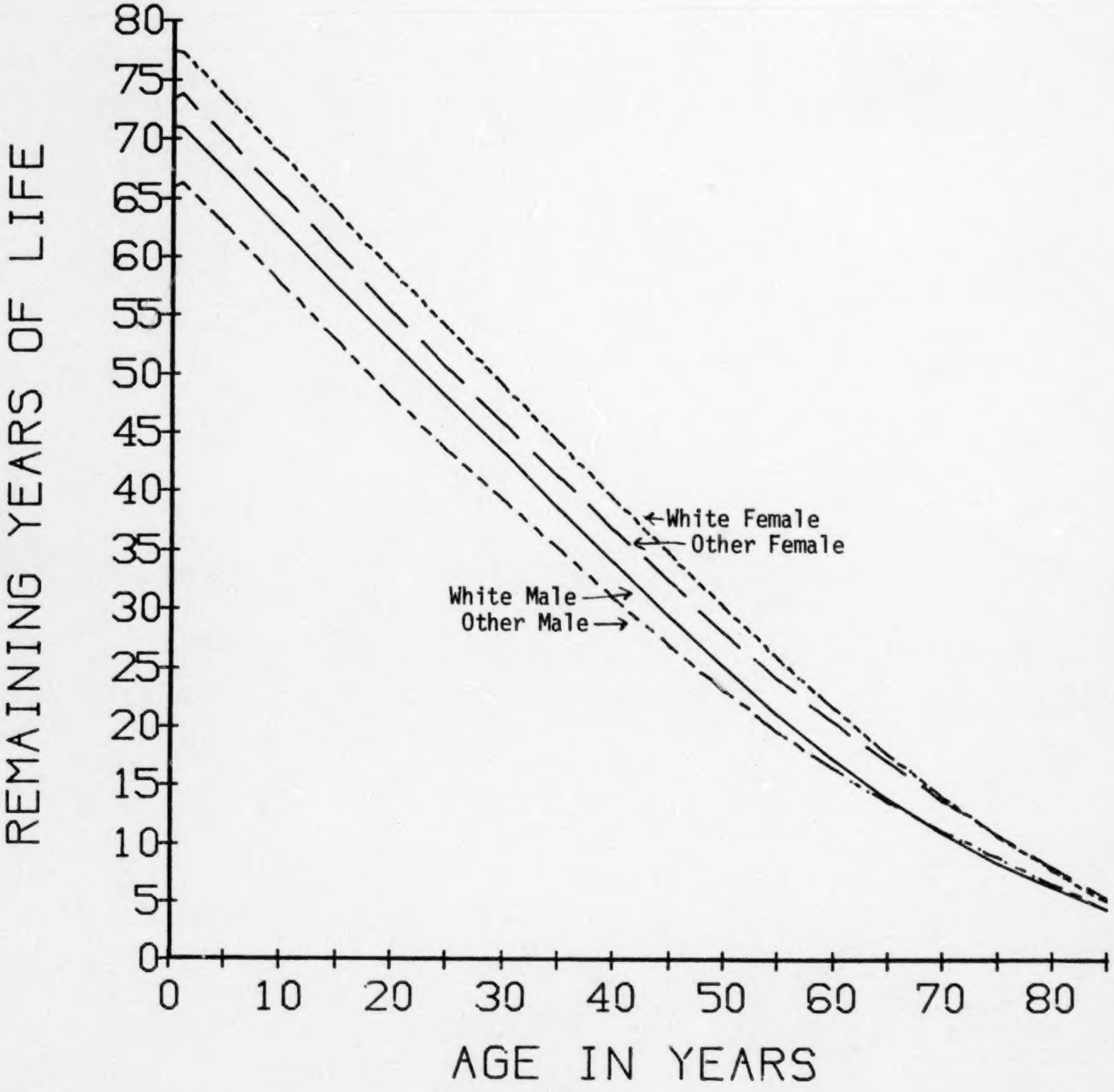
UNITED STATES		YEAR	MICHIGAN	
MALE	FEMALE		MALE	FEMALE
47.6	50.6	1901	53.4	55.1
48.4	51.8	1910	53.9	56.2
53.6	54.6	1920	55.1[1]	56.0[1]
58.1	61.6	1930	59.8[1]	62.8[1]
60.8	65.2	1940	63.4[1]	67.4[1]
65.6	71.1	1950	65.7	71.2
66.6	73.1	1960	67.1	73.3
67.1	74.8	1970	67.2	74.6
67.4	75.0	1971	67.3	74.9
67.4	75.1	1972	67.3	74.9
67.6	75.3	1973	67.4	75.0
68.1	75.8	1974	68.0	75.3
68.7	76.5	1975	68.5	75.7
69.0	76.7	1976	69.0	75.9
69.3	77.1	1977	69.3	76.3
69.5	77.2	1978	69.6	76.4
69.9	77.6	1979	70.0	76.8
---	---	1980	70.0	76.9
---	---	1981	70.2	76.9

[1] Michigan data for years 1920, 1930, and 1940 are for white persons only.

Table 2.71
Life Expectancy at Birth by Sex and Race, Michigan Residents, Selected Years 1950-1981

POPULATION SUBGROUP	YEAR				
	1950	1960	1970	1980	1981
Total Population	68.3	70.0	70.8	73.4	73.6
Total Male	65.7	67.1	67.2	70.0	70.2
Total Female	71.2	73.3	74.6	76.9	76.9
Total White	68.8	70.5	71.6	74.2	74.3
White Male	66.2	67.5	68.2	70.9	71.0
White Female	71.9	74.0	75.3	77.5	77.5
Total All Other	61.8	65.6	65.0	69.3	69.5
All Other Male	60.4	63.6	61.0	65.3	65.8
All Other Female	63.4	67.7	69.4	73.3	73.4

FIGURE 2.51 REMAINING YEARS OF LIFE BY AGE, SEX, AND RACE, MICHIGAN RESIDENTS, 1981



and 4.0 years for other than white males and females. Other than white persons display slightly greater life expectancies in the older age intervals than their white counterparts. The average number of years remaining for other than white females surpasses that of white females between ages 70 and 75. Other than white males display a greater expectation than that of white males at ages 70 and over.

PLACE OF OCCURRENCE

There were 2,260 Michigan resident deaths in 1981 that occurred outside the state. This represents 3.0 percent of all resident deaths. 498 Michigan resident deaths occurred in the state of Florida in 1981. This is 22.0 percent of all resident out-of-state deaths, more than in any other area. The border areas of Indiana, Ohio, Wisconsin, and Canada accounted for 44.3 percent of all resident deaths outside Michigan. In addition to the above-mentioned areas, over 50 Michigan resident deaths also occurred in each of the following states: Illinois, Texas, Minnesota, California, and Arizona. Michigan resident deaths occurred in all but four of the 50 states in 1981 (Table 2.72).

Of the 1,127 non-residents that died in Michigan in 1981, 42.9 percent were from the border areas, 18.9 percent were Floridians and 8.0 percent were from Illinois. Overall, non-residents who died in Michigan represented 44 states and several foreign countries.

Table 2.72
Michigan Resident Deaths Occurring Outside Michigan by Place of Occurrence and Deaths Occurring in Michigan to Non-Michigan Residents by Place of Residence, 1981

GEOGRAPHIC AREA	DEATHS OF RESIDENTS OCCURRING OUTSIDE MICHIGAN		DEATHS OF NONRESIDENTS OCCURRING IN MICHIGAN	
	NUMBER	PERCENT	NUMBER	PERCENT
Total	2,260	100.0	1,127	100.0
Florida	498	22.0	213	18.9
Ohio	409	18.1	177	15.7
Indiana	305	13.5	96	8.5
Wisconsin	227	10.0	165	14.6
Illinois	103	4.6	90	8.0
Texas	92	4.1	20	1.8
Minnesota	63	2.8	9	0.8
Canada	60	2.7	46	4.1
California	58	2.6	29	2.6
Arizona	58	2.6	16	1.4
Other Areas	387	17.1	266	23.6

MARRIAGE & DIVORCE

SECTION III

MARRIAGE AND DIVORCE: AN OVERVIEW 1981

TOTAL MARRIAGES	85,252
TOTAL DIVORCES AND ANNULMENTS	43,167
MARRIAGE RATE[1]	18.4
DIVORCE RATE[1]	9.3
MEDIAN AGE OF THE BRIDE	23
MEDIAN AGE OF THE GROOM	25

[1] Number of persons married or divorced per 1,000 population.

MARRIAGES AND DIVORCES

The number of marriages and divorces occurring in Michigan has increased considerably since 1900. While the frequency of marriage has generally followed the growth of Michigan's population, the rate of persons dissolving their marriages has increased nearly fourfold since 1900. The smallest number of marriages in the years 1900 to 1981 was 23,295 in 1900, while the largest number was 94,486 in 1973. After steep declines in the number of marriages in 1974 and 1975 and a smaller decline in 1976, the number of marriages increased during each of the following three years. In 1980 and 1981 the number of marriages declined. The number of marriages recorded in 1981 was 85,252, a decrease of 1.9 percent from the 1980 figure. The number of divorces and annulments has increased from a low of 2,435 in 1900 to a high of 45,047 in 1980. In 1981 the number of divorces and annulments was 43,167. This represents a decrease of 4.2 percent from the figure for 1980.

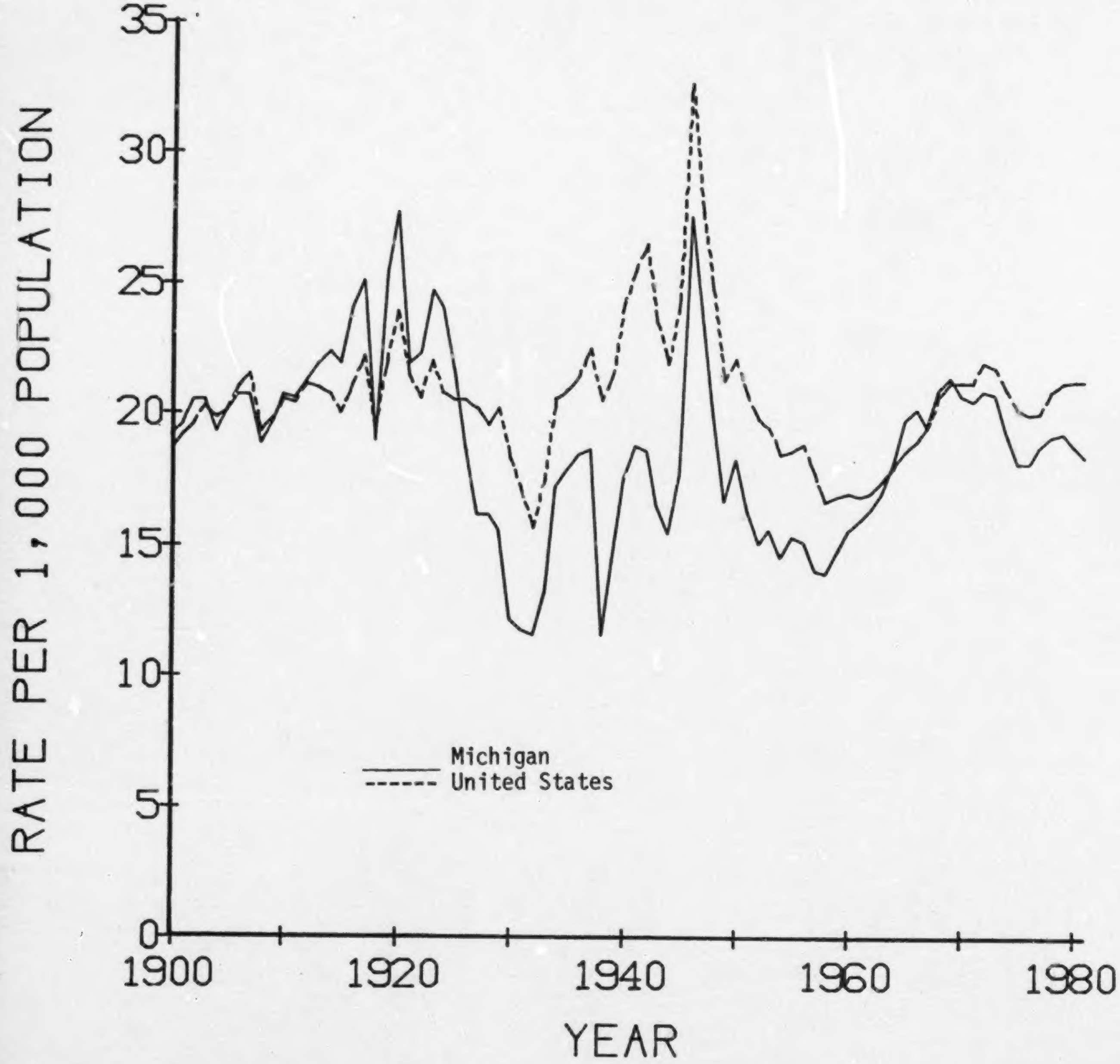
MARRIAGES

Since 1900 there have been noticeable changes in the marriage rates both nationally and in Michigan (Figure 3.1). The marriage rates observed for the state have generally followed the pattern of rising and falling rates observed nationally. Strong historic shifts in rates have been related most notably to the factors of war and the economy. The highest rates observed during this century were for the years immediately following the end of the two World Wars (27.7 in 1919 and 27.6 in 1946). The lowest rates occurred during the Great Depression of the 1930's.

The number of persons married each year per 1,000 population was higher in Michigan than in the country for 19 of the 26 years from 1900 through 1925. Since 1926, Michigan's marriage rate has been lower than that of the nation, excepting only the years 1964 through 1969. The gap between the marriage rate for Michigan and that for the nation has increased in recent years. In 1977 the U.S. rate (including nonlicensed marriages registered in California) was 8.5 percent above that of Michigan. This percent increased to 13.3 in 1980, and in 1981 the provisional rate for the nation was 15.8 percent above Michigan's rate.

The marriage rate for Michigan in 1981 was 18.4, 2.1 percent lower than the 1980 rate of 18.8 (Table 3.1). The provisional rate for the nation in 1981 was unchanged from the 1980 rate of 21.3.

FIGURE 3.1 MARRIAGE RATES, MICHIGAN AND UNITED STATES OCCURRENCES, 1900-1981[1]



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[1] United States rates for 1980 and 1981 are provisional.

Table 3.1
Marriages and Marriage Rates[1], Michigan and United States Occurrences, Selected Years, 1920-1981

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
1,274,476	23.9	1920	50,805	27.7
1,126,856	18.3	1930	29,482	12.2
1,595,879	24.2	1940	46,342	17.6
1,667,231	22.1	1950	58,180	18.3
1,523,000	17.0	1960	61,090	15.6
1,548,000	16.9	1961	63,320	16.0
1,577,000	17.0	1962	65,002	16.4
1,654,000	17.5	1963	68,160	17.0
1,725,000	18.0	1964	73,911	18.2
1,800,000	18.6	1965	81,247	19.8
1,857,000	19.0	1966	83,903	20.2
1,927,000	19.5	1967	84,363	19.6
2,069,000	20.7	1968	90,984	21.0
2,145,000	21.2	1969	93,392	21.4
2,158,802	21.2	1970	91,933	20.7
2,190,481	21.2	1971	92,134	20.5
2,282,154	22.0	1972	94,447	20.9
2,284,108	21.8	1973	94,486	20.8
2,229,667	21.0	1974	88,023	19.3
2,152,662	20.2	1975	82,856	18.2
2,154,807	20.0	1976	82,753	18.2
2,178,367	20.1	1977	86,088	18.8
2,282,272	20.9	1978[2]	88,333	19.2
2,331,337	21.2	1979	89,450	19.3
2,413,000Pr.	21.3Pr.[3]	1980	86,898	18.8
2,438,000Pr.	21.3Pr.	1981	85,252	18.4

[1] Number of persons married per 1,000 population.

[2] Beginning with 1978, marriage data for the United States include nonlicensed marriages registered in California. If nonlicensed marriages were included in the 1977 total, the marriage rate would increase from 20.1 to 20.4.

[3] The rate for 1980 for the United States was revised using a population estimate based on the 1980 census enumeration.

RESIDENCE OF COUPLES MARRYING IN MICHIGAN

When presenting statistics of births, deaths and fetal deaths it is possible to provide total resident figures due to an interstate agreement for exchange of nonresident event information. Thus, should a Michigan resident give birth in some other state, the state will forward the information to Michigan. No such agreement exists for marriages. This is an important consideration when analyzing marriage statistics. The marriage data presented are drawn from all marriages performed in the state regardless of the couples' residence.

Table 3.2 indicates that, in general, most of the couples marrying in Michigan are residents of the state. For marriages occurring in Michigan in 1981 97.0 percent of the brides were residents of Michigan, while 93.7 percent of the grooms were residents of the state. These figures are somewhat higher than those for marriages occurring in Michigan in 1971. Over the decade the proportion of marriages where both the bride and groom are not residents has declined substantially. These data indicate that the general characteristics of marriages occurring in Michigan should be representative of marriage patterns for Michigan residents.

There were a total of 2,561 non-resident brides married in Michigan in 1981. The figure for grooms is double that of brides, numbering 5,413. Table 3.3 shows the most frequent residences of non-resident brides and grooms married in Michigan. The nearby states of Illinois, Indiana, Ohio and Wisconsin are the states of residence for 36 percent of all non-resident grooms and 48 percent of non-resident brides.

MONTH OF MARRIAGE

The number of marriages occurring in Michigan varies with the seasons. The most popular month for marriages in 1981 was August, with 13.3 percent of all marriage ceremonies being performed during this month. May and June were also popular choices, with 10.8 and 12.2 percent respectively of all marriages. Fewer marriages occurred during the winter months. The lowest figure was for January, with about one third the number which occurred in August (Table 3.4)

AGE AT MARRIAGE

Examination of the data in Table 3.5 reveals that females generally marry at a younger age than do males. The number of females who marry before the age of 20 is over two

Table 3.2
Marriages by Residence Status of Bride and Groom, Michigan Occurrences, 1971 and 1981

RESIDENCE STATUS	1971		1981	
	NUMBER	PERCENT	NUMBER	PERCENT
Both Bride and Groom Residents.......	83,671	90.8	79,172	92.9
Bride Resident, Groom Non-Resident...	3,628	3.9	3,519	4.1
Groom Resident, Bride Non-Resident...	972	1.1	667	0.8
Both Bride and Groom Non-Residents...	3,862	4.2	1,894	2.2
Residence Status, Not Stated........	1	0.0	-	000
Total..............................	92,134	100.0	85,252	100.0

Table 3.3
Place of Residence of Non-resident Brides and Grooms, Marriages Occurring in Michigan, 1981

GEOGRAPHIC AREA	NON-RESIDENT BRIDE	NON-RESIDENT GROOM
California	155	380
Colorado	79	159
Florida	159	326
Illinois	261	481
Indiana	302	443
Minnesota	48	102
New York	77	205
Ohio	387	628
Texas	158	529
Virginia	40	110
Wisconsin	279	397
Other U.S. Places	549	1,448
Foreign Countries	67	205
Total	2,561	5,413

Table 3.4
Marriages by Month, Michigan Occurrences, 1981

MONTH	NUMBER	PERCENT
January	3,897	4.6
February	4,860	5.7
March	4,459	5.2
April	5,561	6.5
May	9,187	10.8
June	10,390	12.2
July	8,097	9.5
August	11,326	13.3
September	8,261	9.7
October	8,301	9.7
November	5,650	6.6
December	5,263	6.2
January - December	85,252	100.0

Table 3.5
Number of Marriages and Marriage Rates[1] by Age and Sex, Michigan Occurrences, 1971 and 1981

AGE IN YEARS	MALES			FEMALES		
	NUMBER OF MARRIAGES 1981	RATE 1981	RATE 1971	NUMBER OF MARRIAGES 1981	RATE 1981	RATE 1971
Under 20[2]	6,086	13.8	36.6	15,886	36.8	76.6
20-24	31,241	70.8	122.7	33,327	73.6	90.9
25-34	31,044	40.0	34.8	24,400	30.6	21.7
35-44	9,106	17.6	12.6	6,654	12.3	9.5
45 or Over	7,770	6.3	6.7	4,981	3.4	4.4
Not Stated	5	000	000	4	000	000
Total	85,252	18.9	21.0	85,252	17.9	20.1
Median Age at Last Birthday	25	000	000	23	000	000

[1] Number of persons married per 1,000 population.
[2] 15-19 population used to obtain rate.

and a half times the corresponding frequency for males. Between ages 20 and 24 the numbers of brides and grooms are similar. Among persons 25 and over, males marry more frequently than females. In 1981 the median age of brides marrying in Michigan was 23 years, while the 50th percentile for grooms was 25.

Since 1971, there have been significant declines in the marriage rate for persons of both sexes under the age of 25 years. The largest decline observed is for males under the age of 20 years for whom the marriage rate has dipped 62.3 percent. The comparable decline for females was 52.0 percent. The marriage rate declined by 42.3 percent and 19.0 percent respectively for males and females between the ages of 20 and 24. For persons between the ages of 25 and 44 the rates of marriage have increased since 1971 for both sexes, while rates for persons 45 and over have dropped.

The distribution of marriages by the age of bride and groom is shown in Table 3.6.

REMARRIAGES

Between 1971 and 1981 the percent of all marriages that were remarriages increased from 23.9 to 31.9 for brides and from 25.0 to 34.3 for grooms (Tables 3.7 and 3.8). The proportion of all marriages which are remarriages is displayed graphically in Figure 3.2 for the period 1960-1981. Between 1960 and 1965, the proportion of remarriages dropped. Since 1965, this proportion has increased. The increase in the period 1972 through 1975 was especially marked for both sexes.

The frequency of remarriages among females increased by 23.5 percent between 1971 and 1981, while the number of brides who had been married at least three times previously increased by 47.4 percent. The increases for males were even more dramatic. Total remarriages increased by 27.1 percent and fourth or higher order marriages increased in frequency by 68.8 percent between 1971 and 1981 (Tables 3.9 and 3.10).

As remarriages can only occur when a prior marriage has been terminated by divorce, annulment or death of a spouse, it is apparent that persons remarrying will be generally older. Tables 3.9 and 3.10 demonstrate that the order of marriage has a strong positive relationship with the age of both brides and grooms. Note, however, the downward shift between 1971 and 1981 in the age distribution for third and higher order marriages. The median age at marriage for third marriages declined by five years for brides and by three years for grooms during this period, while for fourth and higher order marriages the median age declined by two

Table 3.6
Marriages by Age of Bride and Age of Groom, Michigan Occurrences, 1981

AGE OF GROOM	AGE OF BRIDE												
	Total	Under 20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and Over	Not Stated
Total	85,252	15,886	33,327	16,311	8,089	4,101	2,553	1,605	1,157	810	615	451	343	4
Under 20	6,086	4,861	1,089	99	24	7	4	1	1	-	-	-	-	-
20-24	31,241	9,238	18,980	2,467	443	82	22	7	1	1	-	-	-	-
25-29	20,582	1,379	9,681	7,388	1,698	347	67	16	4	-	-	-	-	2
30-34	10,462	275	2,522	4,083	2,635	726	167	45	6	3	-	-	-	-
35-39	5,663	94	715	1,437	1,781	1,086	404	111	24	6	4	1	-	-
40-44	3,443	21	200	520	824	926	652	211	65	19	4	-	1	-
45-49	2,392	12	80	202	406	519	584	405	138	33	11	1	1	-
50-54	1,760	3	24	73	184	257	379	391	277	120	40	10	2	-
55-59	1,354	2	23	26	52	99	194	240	346	245	94	25	8	-
60-64	929	-	9	10	30	34	58	120	186	214	169	80	19	-
65-69	615	-	2	3	8	14	17	44	67	104	181	136	39	-
70 and Over	720	-	1	3	3	4	5	14	42	65	112	198	273	-
Not Stated	5	1	1	-	1	-	-	-	-	-	-	-	-	2

Table 3.7
Age at First Marriage and Remarriage: Bride, Michigan Occurrences, 1971 and 1981

AGES	1971				1981			
	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED
Under 20.....	33,689	33,227	415	47	15,886	15,723	155	8
Percent....	36.6	47.5	1.9	72.3	18.6	27.1	0.6	53.3
20-24........	35,042	30,646	4,386	10	33,327	29,931	3,395	1
Percent....	38.0	43.8	19.9	15.4	39.1	51.6	12.5	6.7
25-29........	8,549	4,138	4,409	2	16,311	9,466	6,840	5
Percent....	9.3	5.9	20.0	3.1	19.1	16.3	25.1	33.3
30-34........	3,987	973	3,012	2	8,089	2,029	6,059	1
Percent....	4.3	1.4	13.7	3.1	9.5	3.5	22.3	6.7
35-44........	4,912	629	4,282	1	6,654	609	6,045	-
Percent....	5.3	0.9	19.4	1.5	7.8	1.0	22.2	-
45 or Over...	5,952	407	5,542	3	4,981	247	4,734	-
Percent....	6.5	0.6	25.1	4.6	5.8	0.4	17.4	-
Not Stated...	3	2	1	-	4	1	3	-
Percent....	0.0	0.0	0.0	-	0.0	0.0	0.0	-
Total........	92,134	70,022	22,047	65	85,252	58,006	27,231	15
Percent....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Median Age at Last Birthday	21	20	32	18	23	21	32	*

Table 3.8
Age at First Marriage and Remarriage: Groom, Michigan Occurrences, 1971 and 1981

AGES	1971				1981			
	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED	TOTAL	FIRST MARRIAGE	RE-MARRIAGE	NOT STATED
Under 20.....	16,136	16,044	60	32	6,086	6,070	10	6
Percent....	17.5	23.2	0.3	58.2	7.1	10.8	0.0	31.6
20-24........	42,245	39,692	2,540	13	31,241	29,698	1,538	5
Percent....	45.9	57.4	11.0	23.6	36.6	53.0	5.3	26.3
25-29........	13,869	9,306	4,560	3	20,582	14,834	5,746	2
Percent....	15.1	13.5	19.8	5.5	24.1	26.5	19.7	10.5
30-34........	5,700	2,056	3,642	2	10,462	3,790	6,669	3
Percent....	5.9	3.0	15.8	3.6	12.3	6.8	22.8	15.8
35-44........	6,241	1,248	4,991	2	9,106	1,158	7,947	1
Percent....	6.8	1.8	21.7	3.6	10.7	2.1	27.2	5.3
45 or Over...	7,943	745	7,195	3	7,770	464	7,304	2
Percent....	8.6	1.1	31.3	5.5	9.1	0.8	25.0	10.5
Not Stated...	-	-	-	-	5	3	2	-
Percent....	-	-	-	-	0.0	0.0	0.0	-
Total........	92,134	69,091	22,988	55	85,252	56,017	29,216	19
Percent....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Median Age at Last Birthday	23	21	36	19	25	23	35	*

FIGURE 3.2 PERCENT OF ALL MARRIAGES THAT ARE REMARRIAGES, MICHIGAN OCCURRENCES, 1960-1981

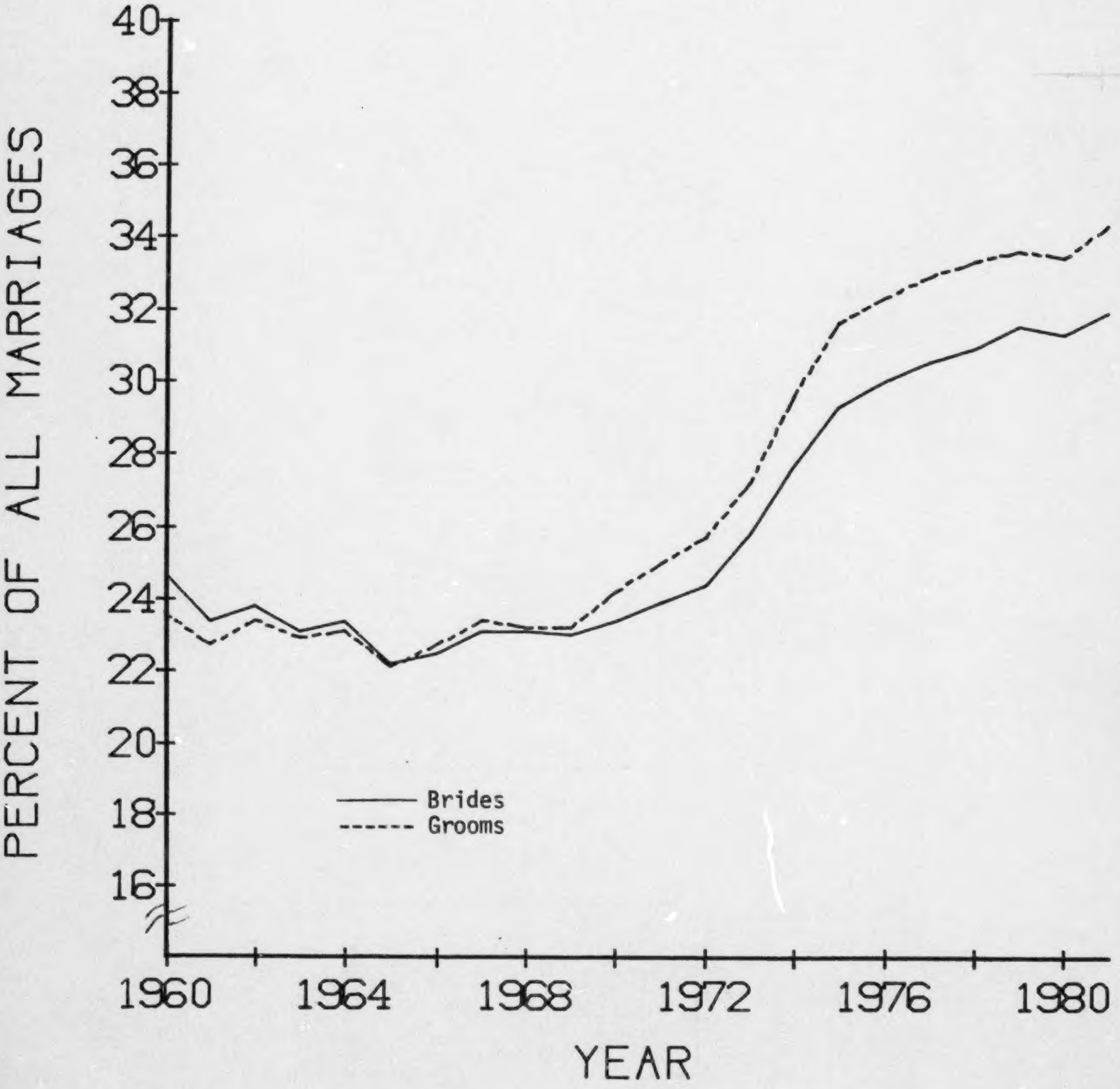


Table 3.9
Remarriages of Brides by Age and Order of Marriage, Michigan Occurrences, 1971 and 1981

AGES	1971				1981			
	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES
All Ages....	92,134	17,670	3,617	760	85,252	21,371	4,740	1,120
Under 20....	33,689	411	3	1	15,886	152	3	-
20-24.......	35,042	4,147	225	14	33,327	3,253	134	8
25-29.......	8,549	3,887	463	59	16,311	6,019	753	68
30-34.......	3,987	2,378	540	94	8,089	4,722	1,122	215
35-39.......	2,678	1,705	443	122	4,101	2,542	883	227
40-44.......	2,234	1,395	501	116	2,553	1,560	629	204
45 or Over..	5,952	3,746	1,442	354	4,981	3,120	1,216	398
Not Stated..	3	1	-	-	4	3	-	-
Median Age at Last Birthday	21	30	41	43	23	31	36	41

Table 3.10
Remarriages of Grooms by Age and Order of Marriage, Michigan Occurrences, 1971 and 1981

AGES	1971				1981			
	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES	ALL MARRIAGES	SECOND MARRIAGES	THIRD MARRIAGES	4TH OR MORE MARRIAGES
All Ages....	92,134	18,774	3,544	670	85,252	22,932	5,153	1,131
Under 20....	16,136	60	-	-	6,086	10	-	-
20-24.......	42,245	2,475	61	4	31,241	1,500	38	-
25-29.......	13,869	4,139	391	30	20,582	5,324	398	24
30-34.......	5,700	3,097	475	70	10,462	5,530	1,007	132
35-39.......	3,413	2,070	474	73	5,663	3,511	1,052	220
40-44.......	2,828	1,776	495	103	3,443	2,142	808	214
45 or Over..	7,943	5,157	1,648	390	7,770	4,913	1,850	541
Not Stated..	-	-	-	-	5	2	-	-
Median Age at Last Birthday	23	34	43	47	25	34	40	44

years for brides and by three years for grooms.

Changes in the frequency of remarriages have varied substantially in different age groups. Among persons under age 25 of both sexes the number of remarriages declined, with the largest relative declines occurring among those under age 20. The number of brides between ages 25 and 29 who had previously been married increased by 55.1 percent between 1971 and 1981, while that of grooms increased 26.0 percent. The largest relative increase in numbers of remarriages for males and females occurred in the age group 30-34 years (83.1 percent for males and 101.2 percent for females). Numbers of remarriages also increased substantially for persons 35-44 years of age. For females 45 and over the number of remarriages declined, while for males the frequency increased slightly.

The most frequent age interval for remarriage among males was 45 years of age or older in 1971 and 35-44 years of age in 1981. For females the most frequent age of remarriage shifted from the 45 and over age group in 1971 to the 25-29 year age group in 1981 (Table 3.7 and 3.8).

FIRST MARRIAGES

First marriages are an interesting component of all marriages in that they constitute an event that can never be duplicated. The frequency of first marriages can not be directly affected by rates of divorce or deaths to married persons and as such reflects the propensity of the population as a whole to enter into marital agreements.

There has been a general decline in both the number and rate of first marriages between 1971 and 1981. The number of first marriages dropped 17.2 percent for women and 18.9 percent for men. The rate of first marriages dropped 20.3 percent for women and 21.0 percent for men. This downward trend in the number and rate of first marriages has not been consistent, however. For men and women, the number and rate of first marriages remained fairly constant between 1971 and 1973, dropped between 1973 and 1976, increased between 1976 and 1979, and fell in 1980 and 1981 (Tables 3.11, 3.12, 3.13 and 3.14).

Changes in the frequency of first marriages have varied in different age groups. The greatest decline in first marriages occurred in the under 20 age group for both brides and grooms, and the decline has been consistent over the period 1972-1981. The number of first marriages in the under 20 age group dropped by 52.7 percent for brides and by 62.2 percent for grooms between 1971 and 1981 while the corresponding rate for first marriages dropped 51.7 percent for brides and 62.1 percent for grooms. The number and rate

Table 3.11
First Marriages by Age of Bride, Michigan Occurrences, 1971-1981

AGE OF BRIDE	YEAR										
	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
All Ages	58,006	59,656	61,281	60,956	59,832	57,860	58,554	63,564	70,076	71,373	70,022
15-19 Years[1]	15,723	17,541	19,531	20,858	22,341	23,208	24,723	28,238	32,658	33,948	33,227
20-24 Years	29,931	30,620	31,260	30,356	28,893	27,014	26,604	28,153	30,249	30,771	30,646
25-29 Years	9,466	8,895	8,059	7,412	6,348	5,634	5,189	5,094	5,036	4,615	4,138
30-34 Years	2,029	1,781	1,595	1,469	1,377	1,113	1,075	1,108	1,108	1,048	973
35-39 Years	449	415	402	418	385	381	422	382	395	403	408
40-44 Years	160	160	166	165	173	205	177	204	228	217	221
45-49 Years	82	95	110	104	118	126	132	152	154	139	153
50 or Over	165	149	156	173	197	177	229	233	247	228	254
Not Stated	1	-	2	1	-	2	3	-	1	4	2

[1] Brides under age 15 included in age 15-19.

Table 3.12
First Marriages by Age of Groom, Michigan Occurrences, 1971-1981

AGE OF GROOM	YEAR										
	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
All Ages	56,017	57,840	59,356	58,806	57,737	55,962	56,655	61,884	68,682	70,120	69,091
15-19 Years	6,070	6,810	7,906	8,267	9,481	10,206	11,188	13,209	15,468	16,416	16,044
20-24 Years	29,698	31,256	32,501	32,900	32,269	30,961	31,327	34,283	38,436	39,641	39,692
25-29 Years	14,834	14,654	13,924	13,026	11,706	10,916	10,336	10,455	10,596	10,048	9,306
30-34 Years	3,790	3,580	3,360	2,996	2,653	2,288	2,157	2,208	2,289	2,139	2,056
35-39 Years	879	816	837	797	747	665	680	716	749	759	794
40-44 Years	279	292	332	297	324	343	322	339	418	415	454
45-49 Years	167	170	160	183	198	226	241	260	314	294	317
50 or Over	297	262	335	340	358	355	404	412	412	408	428
Not Stated	3	-	1	-	1	2	-	2	-	-	-

Table 3.13
First Marriage Rates[1] by Age of Bride, Michigan Occurrences, 1971-1981

AGE OF BRIDE	YEAR										
	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
All Ages	12.2	12.6	12.9	12.9	12.8	12.4	12.6	13.7	15.1	15.5	15.3
15-19 Years[2]	36.5	39.3	43.8	46.9	50.4	52.5	55.8	63.6	73.7	76.9	75.5
20-24 Years	66.1	67.6	69.8	69.1	67.1	63.9	63.9	68.7	75.2	78.1	79.5
25-29 Years	22.8	21.8	20.1	19.1	16.8	15.4	14.5	14.7	15.0	14.2	13.1
30-34 Years	5.3	4.9	4.5	4.3	4.2	3.5	3.5	3.7	3.9	3.8	3.7
35-39 Years	1.5	1.4	1.4	1.5	1.4	1.4	1.6	1.4	1.5	1.6	1.6
40-44 Years	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.9	0.8	0.8
45-49 Years	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.6
50 or Over	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2

[1] Number of persons married per 1,000 population.
[2] Brides under 15 included in age 15-19.

Table 3.14
First Marriage Rates[1] by Age of Groom, Michigan Occurrences, 1971-1981

AGE OF GROOM	YEAR										
	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
All Ages	12.4	12.8	13.2	13.1	12.9	12.6	12.7	13.9	15.5	15.9	15.7
15-19 Years	13.8	15.0	17.4	18.3	21.1	22.8	25.0	29.5	34.7	37.0	36.4
20-24 Years	67.3	70.8	75.0	78.1	78.8	77.7	80.7	90.6	104.6	111.4	115.3
25-29 Years	36.5	36.7	35.5	34.2	31.7	30.4	29.6	30.7	32.1	31.5	30.2
30-34 Years	10.3	10.3	9.9	9.1	8.4	7.5	7.3	7.7	8.3	8.1	8.1
35-39 Years	3.1	2.9	3.0	3.0	2.8	2.6	2.7	2.8	3.0	3.1	3.3
40-44 Years	1.2	1.3	1.4	1.3	1.4	1.4	1.3	1.4	1.7	1.6	1.8
45-49 Years	0.8	0.8	0.7	0.8	0.9	1.0	1.0	1.1	1.3	1.2	1.2
50 or Over	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.5

[1] Number of persons married per 1,000 population.

of first marriages also declined substantially for grooms in the 20-24 year age group.

There were significant increases in the number and rate of first marriages of both brides and grooms between ages 25 and 34. These increases were especially sharp during the latter half of the period. Between 1976 and 1981 the number of first marriages increased by 35.9 percent and 65.6 percent for grooms aged 25-29 and 30-34 years respectively. For brides the comparable figures were 68.0 percent and 82.3 percent. Since 1971 the number of first marriages has declined for persons aged 40 or over.

MEDIAN AGE AT FIRST MARRIAGE

The median age at first marriage declined for both brides and grooms between 1953 and the mid-1960's. This decline was greater for males than for females. Grooms were 34 months older than brides at the median in 1953, 23 months older in 1963 and 20 months older in 1968. During the past thirteen years, the median age at first marriage has increased by a similar amount for both males and females. Grooms were 21 months older than brides at the median in 1981.

The median age at first marriage in 1981 was 21 years 10 months for brides and 23 years 7 months for grooms. The 1981 figures are the highest median ages at first marriage recorded during the period (Figure 3.3).

DIVORCES AND ANNULMENTS

The number of reported divorces and annulments reached a record high in 1980, both in Michigan and the nation. The figure of 43,167 for Michigan in 1981 was 4.2 percent below the number for 1980. The 1981 provisional figure for the United States was 3.1 percent higher than the provisional 1980 total (Table 3.15).

The number of divorces and annulments reported for Michigan in 1981 was 2.6 times the number for 1960. In recent years the number of divorces and annulments has begun to level off. Between 1960 and 1970 the number of divorces and annulments increased by 80 percent. During the decade of the seventies the increase was 50 percent. Between 1970 and 1975 the number of divorces and annulments increased by 36 percent, and from 1975 to 1980 the increase was 10 percent. During the latter period the first annual declines since 1963 occurred. In 1981 the number again declined.

The number of persons divorced in Michigan per thousand population decreased from 9.7 in 1980 to 9.3 in 1981, while

FIGURE 3.3 MEDIAN AGE AT FIRST MARRIAGE BY SEX, MICHIGAN OCCURRENCES, 1953-1981

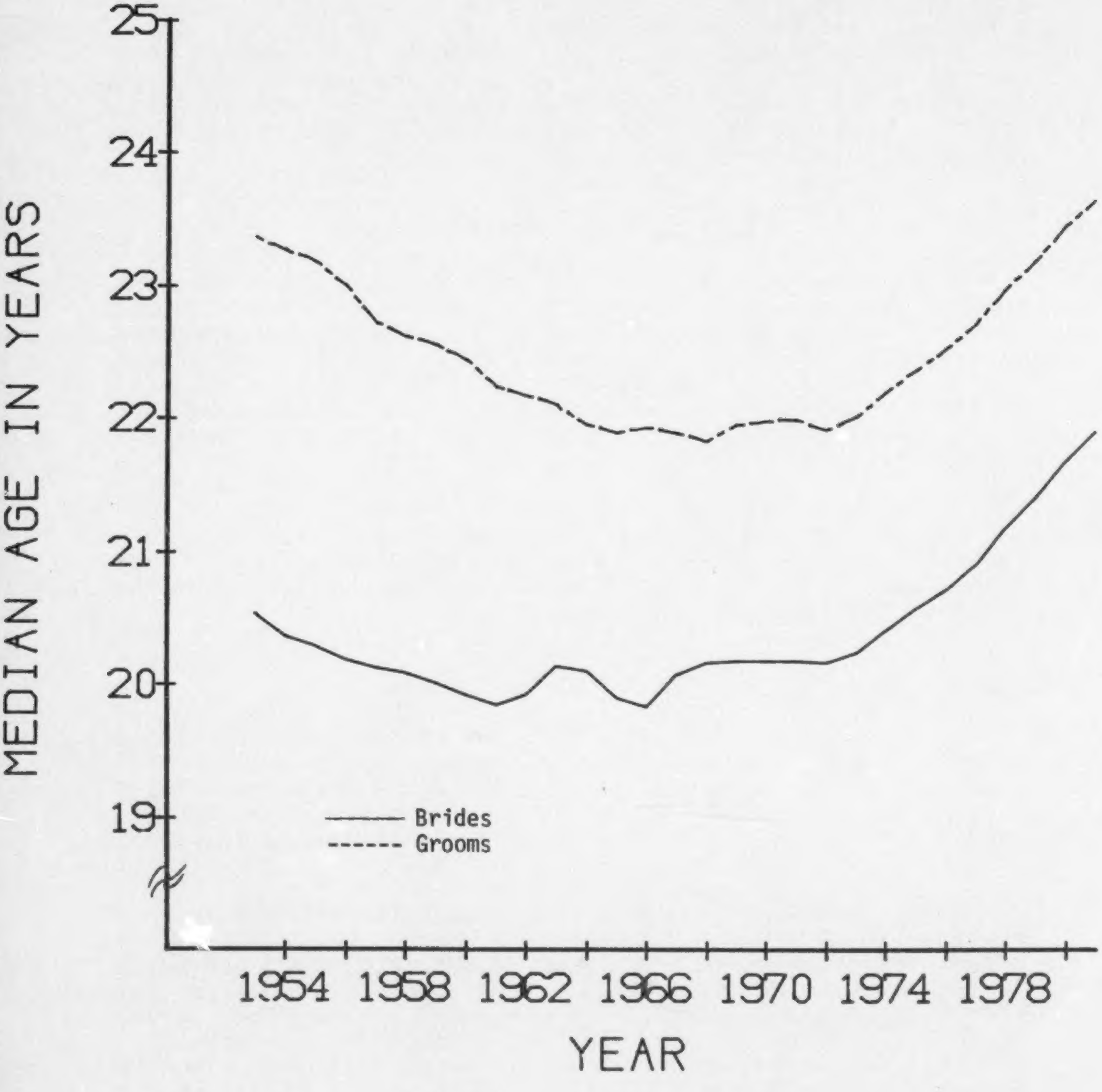


Table 3.15
Number of Divorces and Annulments, and Divorce and Annulment Rates[1], Michigan and United States Occurrences, Selected Years, 1920-1981

UNITED STATES		YEAR	MICHIGAN	
NUMBER	RATE		NUMBER	RATE
170,505	3.2	1920	8,679	4.7
195,961	3.2	1930	10,639	4.4
264,000	4.0	1940	12,054	4.6
385,144	5.1	1950	15,979	5.0
393,000	4.4	1960	16,656	4.3
414,000	4.5	1961	16,219	4.1
413,000	4.4	1962	17,500	4.4
428,000	4.5	1963	17,479	4.4
450,000	4.7	1964	19,400	4.8
479,000	4.9	1965	20,305	5.0
499,000	5.1	1966	21,727	5.2
523,000	5.3	1967	23,620	5.5
584,000	5.8	1968	25,400	5.9
639,000	6.3	1969	28,347	6.5
708,000	7.0	1970	29,934	6.7
773,000	7.5	1971	31,790	7.1
845,000	8.1	1972	35,505	7.9
915,000	8.7	1973	37,128	8.2
977,000	9.2	1974	39,940[2]	8.8[2]
1,036,000	9.7	1975	40,782	9.0
1,083,000	10.1	1976	43,101	9.5
1,091,000	10.1	1977	43,036	9.4
1,130,000	10.4	1978	45,029	9.8
1,181,000	10.7	1979	44,242	9.6
1,182,000Pr.	10.4Pr.[3]	1980	45,047	9.7
1,219,000Pr.	10.6Pr.	1981	43,167	9.3

[1] Number of persons whose marriages ended in divorce or annulment per 1,000 population.

[2] Estimate.

[3] The rate for 1980 for the United States was revised using a population estimate based on the 1980 census enumeration.

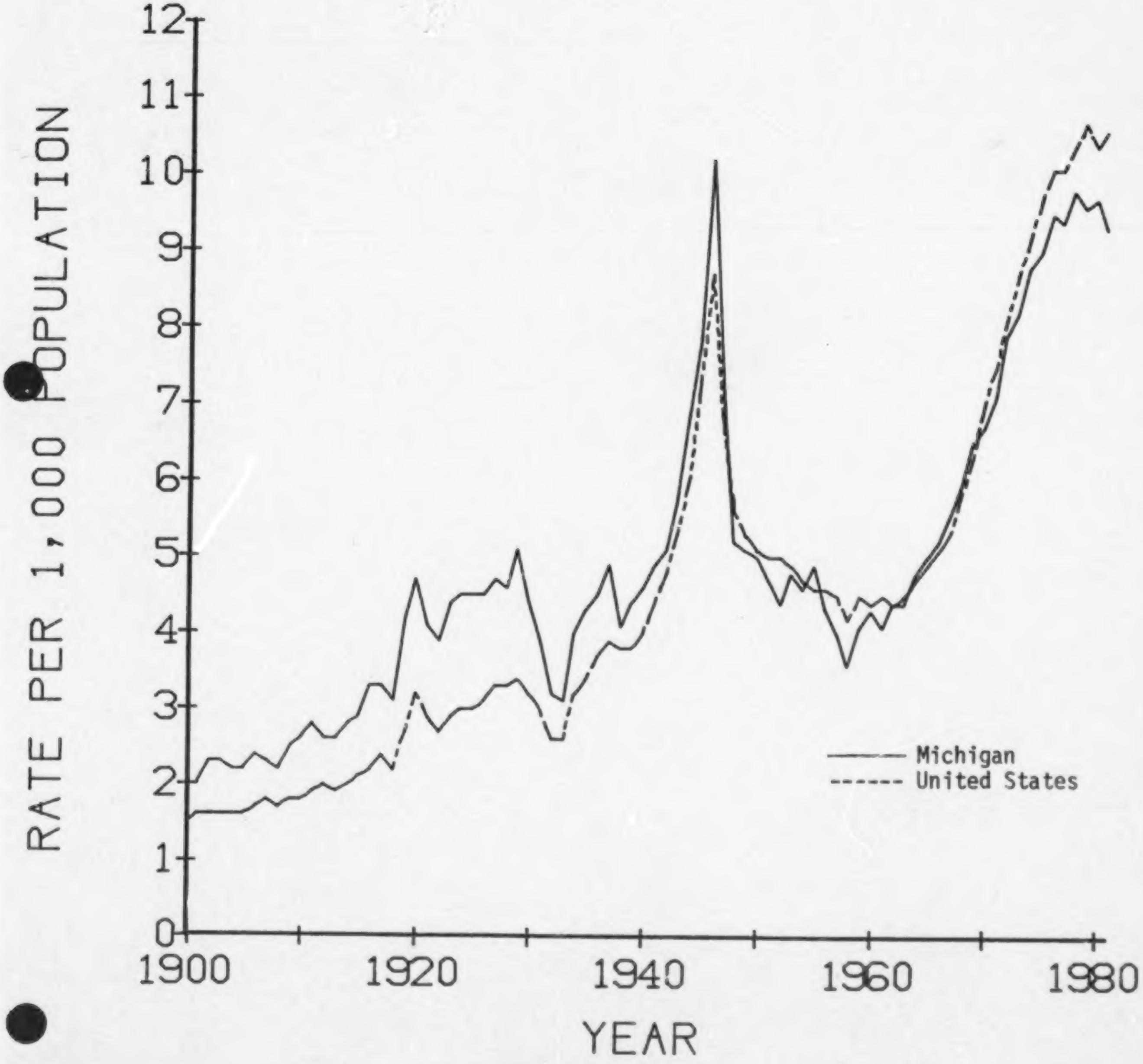
the national rate increased from 10.4 to 10.6. Michigan's divorce rate was higher than that for the United States each year from 1900 through 1947. In the following 34 years the Michigan divorce rate has been at or below the national rate 27 times, including each of the past 12 years (Table 3.15 and Figure 3.4). The lowest rate in this century for Michigan was 2.0 in the years 1900 and 1901 while the lowest national rate was 1.5 in 1900. The highest divorce rate for Michigan during this century was recorded in 1946 (10.2).

The number of children under 18 of couples dissolving marriages in 1981 was at least 45,461 (Table 3.16). This is 4.7 percent more than in 1971. The number of children affected by divorce has increased as a proportion of all children. This ratio increased from 6.5 per 1,000 Michigan children in 1960 to 12.5 in 1970 and 16.8 in 1981 (Table 3.17). The average number of children per divorce has, nonetheless, dropped from 1.36 children in 1970 to 1.05 in 1981. The decline primarily reflects a decline in the proportion of divorces involving three or more children. It should be noted that Michigan live birth data indicate that there has been a decline in the relative proportion of women having third or higher order live births over the past decade. Data for the United States indicate a similar pattern.

Approximately 25 percent of the persons divorced in 1981 in Michigan were from 25 to 29 years of age (Table 3.18). The median age for husbands was 33 years and 0 months, while the median age for wives was 30 months younger (30 years and 6 months). Nearly 22 percent of the wives were under 25 years of age compared to nearly 13 percent of the husbands. Conversely, 5.8 percent of the wives were 50 years of age or older compared to 9.5 percent of the husbands.

In 11.6 percent of the marriages dissolved in Michigan in 1981 the couple separated less than one year after the marriage took place, and in nearly half of the marriages ended by divorce or annulment the separation took place within five years of the date of marriage (Table 3.19). The median duration of marriage at the time of dissolution was 7 years and 3 months. The median length of time between the date of separation and the date of dissolution of the marriage was 11 months.

FIGURE 3.4 DIVORCE RATES, MICHIGAN AND UNITED STATES OCCURRENCES, 1900-1981[1]



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[1] United States rates for 1980 and 1981 are provisional.

Table 3.16
Divorces and Annulments by Children Under 18 Present, Michigan Occurrences, 1971 and 1981

NUMBER OF CHILDREN	DIVORCES AND ANNULMENTS				ESTIMATED TOTAL CHILDREN (MINIMUM)[1]	
	NUMBER		PERCENT			
	1971	1981	1971	1981	1971	1981
Zero	11,694	14,925	36.8	34.6	-	-
One	7,619	10,656	24.0	24.7	7,619	10,656
Two	6,209	9,428	19.5	21.8	12,418	18,856
Three	3,332	3,428	10.5	7.9	9,996	10,284
Four	1,704	974	5.4	2.3	6,816	3,896
Five or More	1,172	326	3.7	0.8	6,581	1,769
Not Stated	60	3,430	0.2	7.9	-	-
Total	31,790	43,167	100.0	100.0	43,430	45,461

[1] Total children for marriages involving 8 or more children under 18 is not available.

Table 3.17

Estimated Number of Children Involved in Divorces and Annulments, Average Number of Children Per Divorce, and Rate per 1,000 Children Under 18 Years of Age, Michigan and United States, Selected Years 1960-1981

MICHIGAN			Year	UNITED STATES		
Estimated Number of Children Involved	Average Number of Children Per Divorce	Rate per 1,000 Under 18 Years of Age		Estimated Number of Children Involved	Average Number of Children Per Divorce	Rate per 1,000 Under 18 Years of Age
19,209	1.15	6.5	1960	463,000	1.18	7.2
40,596[1]	1.36[1]	12.5[1]	1970	870,000	1.22	12.5
43,430[1]	1.37[1]	13.4[1]	1971	946,000	1.22	13.6
46,538	1.31	14.4	1972	1,021,000	1.20	14.8
48,153	1.18	15.8	1975	1,123,000	1.08	16.9
49,555	1.15	16.6	1976	1,117,000	1.03	17.1
47,569	1.11	16.3	1977	1,095,000	1.00	17.0
48,510	1.08	17.0	1978	1,147,000	1.01	18.1
47,019	1.07	16.8	1979	1,181,000	1.00	18.9
46,603	1.04	16.9	1980	---	---	---
45,461	1.05	16.8	1981[2]	---	---	---

[1] Revised data.

[2] There were 3,430 records on which the number of children under 18 years of age was not stated.

Table 3.18
Divorces and Annulments by Age of Husband and Wife at Time of Decree, Michigan Occurrences, 1981

AGE	HUSBAND		WIFE	
	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]
Total	43,167	100.0	43,167	100.0
Under 20	106	0.4	560	1.9
20-24	3,554	12.3	5,704	19.8
25-29	6,819	23.6	7,383	25.7
30-34	6,435	22.2	5,852	20.4
35-39	4,492	15.5	3,860	13.4
40-44	2,933	10.1	2,372	8.3
45-49	1,847	6.4	1,341	4.7
50-54	1,255	4.3	822	2.9
55-59	771	2.7	461	1.6
60-64	368	1.3	219	0.8
65-69	198	0.7	89	0.3
70-74	81	0.3	48	0.2
75+	73	0.3	29	0.1
Unknown	14,235	000	14,427	000
Median Age	33 years 0 months	000	30 years 6 months	000

[1] Based on records with known age only.

Table 3.19
Divorces and Annulments by Duration of Marriage at Time of Separation and at Time of Dissolution, Michigan Occurrences, 1981

DURATION IN YEARS	AT TIME OF SEPARATION		AT TIME OF DISSOLUTION	
	NUMBER	PERCENT[1]	NUMBER	PERCENT[1]
Less Than 1	4,529	11.6	1,451	3.4
1-4	13,841	35.4	13,897	32.4
5-9	9,274	23.7	11,830	27.6
10-14	5,113	13.1	6,765	15.8
15-19	2,997	7.7	4,032	9.4
20-24	1,767	4.5	2,430	5.7
25-29	896	2.3	1,326	3.1
30-34	448	1.1	731	1.7
35-39	141	0.4	282	0.7
40-44	35	0.1	91	0.2
45-49	12	0.0	35	0.1
50+	8	0.0	19	0.0
Unknown	4,106	000	278	000
Total	43,167	100.0	43,167	100.0
Median Duration	5 years 5 months	000	7 years 3 months	000

[1] Based on records with known duration only.

REFERENCE APPENDIX

SECTION IV

TABLE 4.1

POPULATION, LIVE BIRTHS, DEATHS (ALL AGES, INFANT, NEONATAL, POSTNEONATAL, PERINATAL, FETAL, AND MATERNAL), MARRIAGES AND DIVORCES, MICHIGAN, 1900-1981

(Deaths exclusive of fetal deaths. Perinatal deaths include deaths under 1 week and fetal deaths. Divorces include annulments.)

Year	Population[1]	Live Births	DEATHS							Marriages	Divorces
			All Ages	Under 1 Year	Under 28 Days[2]	28-364 Days	Peri-natal	Fetal	Maternal		
1900	2,420,982	43,699	32,453	6,866				1,325	452	23,295	2,435
1901	2,459,901	43,221	32,834	6,319				1,501	531	24,079	2,448
1902	2,498,820	45,546	31,472	5,949				1,793	468	25,653	2,828
1903	2,537,739	46,020	33,176	6,488				1,814	427	26,029	2,945
1904	2,576,658	47,508	34,494	6,419				1,911	436	24,918	2,808
1905	2,615,578	46,976	34,679	7,054				2,044	416	26,307	2,825
1906	2,654,497	58,599	37,033	7,952				2,358	400	27,519	3,192
1907	2,693,416	59,029	36,701	6,906				2,358	391	27,940	3,107
1908	2,732,335	64,772	36,761	7,697				2,694	440	25,765	3,020
1909	2,771,254	64,323	36,313	7,443				2,540	405	27,353	3,516
1910	2,810,173	64,109	39,913	7,998				2,559	431	29,039	3,716
1911	2,895,997	65,756	38,007	7,131				2,716	451	29,859	4,125
1912	2,981,821	69,537	38,804	6,985				2,906	396	31,694	3,838
1913	3,067,645	73,058	40,827	7,659				2,953	528	33,529	3,978
1914	3,153,469	76,761	39,906	7,431				3,113	507	35,316	4,395
1915	3,239,293	81,100	40,441	6,943				3,357	488	35,527	4,757
1916	3,325,116	87,062	46,047	8,415				3,639	503	40,143	5,540
1917	3,410,940	89,419	47,236	7,916				3,550	586	42,791	5,627
1918	3,496,764	91,261	54,617	8,197				3,686	709	33,260	5,493
1919	3,582,588	84,062	45,636	7,560				3,361	578	45,579	7,469
1920	3,668,412	92,245	51,982	8,587				3,770	795	50,805	8,679
1921	3,785,799	96,035	44,186	7,584				3,669	605	41,508	7,676
1922	3,903,186	90,042	43,817	6,730				3,779	551	43,561	7,591
1923	4,020,573	92,956	49,333	7,477				3,657	583	49,569	8,745
1924	4,137,960	98,187	47,304	7,088	4,119	2,969	6,791	3,703	636	49,788	9,400
1925	4,255,347	98,983	49,417	7,498	4,022	3,476	6,667	3,670	629	46,276	9,650
1926	4,372,734	98,289	54,080	7,620	4,054	3,566	6,773	3,816	631	39,789	9,795
1927	4,490,121	99,940	50,600	6,766	3,915	2,851	6,794	3,834	667	36,276	10,617
1928	4,607,508	97,462	54,755	6,806	3,739	3,067	6,594	3,701	603	37,300	10,615
1929	4,724,895	98,695	56,117	6,605	3,777	2,828	6,613	3,710	617	36,816	12,094
1930	4,842,325	98,882	51,561	6,213	3,624	2,589	6,518	3,714	597	29,482	10,639
1931	4,883,703	90,547	49,068	5,187	3,084	2,103	5,643	3,220	539	28,856	9,507
1932	4,925,081	85,254	49,569	4,630	2,798	1,832	5,210	2,980	493	28,552	7,889
1933	4,966,459	80,482	48,507	4,094	2,591	1,503	4,906	2,776	447	33,132	7,671
1934	5,007,837	83,944	50,440	4,377	2,717	1,660	4,781	2,607	450	43,241	10,124
1935	5,049,216	87,403	51,051	4,170	2,550	1,620	4,832	2,717	438	45,313	10,844
1936	5,090,594	88,457	54,777	4,479	2,647	1,832	4,726	2,625	425	47,023	11,419
1937	5,131,972	91,566	53,468	4,374	2,700	1,674	4,919	2,707	326	47,954	12,472
1938	5,173,350	96,962	50,678	4,319	2,734	1,585	4,984	2,732	345	30,105	10,646
1939	5,214,728	94,432	52,017	3,952	2,594	1,358	4,706	2,572	280	37,725	11,589

TABLE 4.1 (continued)

Year	Population[1]	Live Births	DEATHS All Ages	Under 1 Year	Under 28 Days[2]	28-364 Days	Peri-natal	Fetal	Maternal	Marriages	Divorces
1940	5,256,106	99,106	52,092	4,022	2,629	1,393	4,749	2,602	292	46,342	12,054
1941	5,437,546	107,498	52,671	4,166	2,687	1,479	4,991	2,769	298	50,989	13,317
1942	5,538,856	124,068	52,738	4,606	3,091	1,515	5,581	3,067	260	51,582	14,085
1943	5,377,329	125,441	56,774	4,804	2,979	1,825	5,563	3,213	237	44,385	15,259
1944	5,377,329	113,586	54,016	4,326	2,784	1,542	5,140	2,874	198	41,678	18,356
1945	5,435,092	111,557	53,641	4,008	2,670	1,338	4,906	2,703	166	48,329	21,133
1946	5,708,415	138,572	54,856	4,541	3,323	1,218	5,978	3,168	163	78,808	29,158
1947	6,069,000	160,275	56,807	5,055	3,677	1,378	6,583	3,422	173	71,319	21,386
1948	6,195,000	153,726	56,520	4,617	3,352	1,265	5,968	3,132	120	61,986	16,017
1949	6,352,000	156,469	57,107	4,520	3,232	1,288	5,746	2,994	105	53,109	16,274
1950	6,371,766	160,055	57,567	4,214	3,043	1,171	5,781	3,095	91	58,180	15,979
1951	6,545,000	172,451	59,181	4,505	3,296	1,209	6,088	3,158	94	53,411	15,446
1952	6,708,000	177,835	59,138	4,689	3,414	1,275	6,266	3,224	82	50,487	14,925
1953	6,852,000	182,968	62,087	4,728	3,369	1,339	6,188	3,180	79	53,308	16,537
1954	7,024,000	192,104	60,706	4,795	3,560	1,235	6,415	3,249	94	51,243	16,281
1955	7,236,000	196,294	63,087	4,873	3,707	1,166	6,381	3,029	61	55,698	17,676
1956	7,516,000	206,068	64,352	5,047	3,796	1,251	6,655	3,245	84	57,068	16,228
1957	7,803,000	208,488	66,435	5,093	3,884	1,209	6,668	3,154	79	55,121	15,442
1958	7,866,000	202,690	65,899	4,980	3,789	1,191	6,516	3,101	69	55,159	14,040
1959	7,960,000	198,301	66,812	4,846	3,674	1,172	6,250	2,928	72	58,826	16,168
1960	7,823,194	195,056	67,912	4,702	3,580	1,122	6,247	3,008	75	61,090	16,656
1961	7,903,000	192,825	67,375	4,604	3,475	1,129	5,875	2,735	78	63,320	16,219
1962	7,939,000	182,790	70,049	4,367	3,251	1,116	5,669	2,703	56	65,002	17,500
1963	8,030,000	178,871	72,438	4,150	3,109	1,041	5,407	2,540	71	68,160	17,479
1964	8,100,000	175,103	72,129	4,043	3,071	972	5,293	2,466	62	73,911	19,400
1965	8,199,283	166,464	73,665	3,936	2,909	1,027	5,139	2,475	54	81,247	20,305
1966	8,314,070	165,794	74,596	3,751	2,830	921	4,909	2,295	54	83,903	21,727
1967	8,615,000	162,756	75,360	3,595	2,714	881	4,693	2,195	52	84,363	23,620
1968	8,675,000	159,058	76,855	3,438	2,617	821	4,476	2,064	44	90,984	25,400
1969	8,734,000	165,760	76,693	3,356	2,550	806	4,488	2,175	27	93,392	28,347
1970	8,875,083	171,667	76,321	3,492	2,683	809	4,522	2,060	29	91,933	29,934
1971	8,972,000	162,244	77,395	3,157	2,412	745	4,139	1,923	32	92,134	31,790
1972	9,025,000	146,854	79,210	2,801	2,115	686	3,700	1,770	35	94,447	35,505
1973	9,072,000	141,550	78,522	2,561	1,902	659	3,392	1,682	26	94,486	37,128
1974	9,109,000	137,414	76,143	2,387	1,734	653	2,947[4]	1,438[4]	19	88,023	39,940[3]
1975	9,108,000	133,931	74,522	2,205	1,563	642	2,673[4]	1,356[4]	16	82,856	40,782
1976	9,117,000	131,378	75,801	1,978	1,424	554	2,495[4]	1,264[4]	14	82,753	43,101
1977	9,157,000	138,416	74,144	1,945	1,367	578	2,452[4]	1,284[4]	11	86,088	43,036
1978	9,202,000	138,802	74,773	1,931	1,281	650	2,319[4]	1,218[4]	15	88,333	45,029
1979	9,249,000	144,452	73,480	1,921	1,295	626	2,326	1,216	11	89,450	44,242
1980	9,262,078	145,162	74,991	1,851	1,284	567	2,276	1,176	16	86,898	45,047
1981	9,270,000	140,579	75,818	1,851	1,281	570	2,194	1,083	7	85,252	43,167

[1]-1971-1979 population estimates have been revised by the U.S. Census Bureau.
[2]-For years prior to 1950 deaths under 1 month of age are included in deaths under 28 days.
[3]-Estimate.
[4]-Revised.

TABLE 4.2
LIVE BIRTH RATES, DEATH RATES (ALL AGES, INFANT, NEONATAL, POSTNEONATAL PERINATAL, AND MATERNAL), FETAL DEATH RATIOS, MARRIAGE AND DIVORCE RATES, MICHIGAN, 1900-1981[1]

(Birth rate, death rate for all ages, rate of persons married and rate of persons divorced per 1,000 population. Fetal death ratio, mortality rates for deaths under 1 year, under 28 days, and from 28-364 days per 1,000 live births. Maternal mortality rate per 10,000 live births. Perinatal mortality rate per 1,000 live births and fetal deaths.)

Year	Live Births	DEATHS							PERSONS	
		All Ages	Under 1 Year	Under 28 Days[2]	28-364 Days	Perinatal	Fetal	Maternal	Married	Divorced
1900	18.1	13.4	157.1				30.3	103.4	19.2	2.0
1901	17.6	13.3	146.2				34.7	122.9	19.6	2.0
1902	18.2	12.6	130.6				39.4	102.8	20.5	2.3
1903	18.1	13.1	141.0				39.4	92.8	20.5	2.3
1904	18.4	13.4	135.1				40.2	91.8	19.3	2.2
1905	18.0	13.3	150.2				43.5	88.6	20.1	2.2
1906	22.1	14.0	135.7				40.2	68.3	20.7	2.4
1907	21.9	13.6	117.0				39.9	66.2	20.7	2.3
1908	23.7	13.5	118.8				41.6	67.9	18.9	2.2
1909	23.2	13.1	115.7				39.5	63.0	19.7	2.5
1910	22.8	14.2	124.8				39.9	67.2	20.7	2.6
1911	22.7	13.1	108.4				41.3	68.6	20.6	2.8
1912	23.3	13.0	100.4				41.8	56.9	21.3	2.6
1913	23.8	13.3	104.8				40.4	72.3	21.9	2.6
1914	24.3	12.7	96.8				40.6	66.0	22.4	2.8
1915	25.0	12.5	85.6				41.4	60.2	21.9	2.9
1916	26.2	13.8	96.7				42.4	57.8	24.1	3.3
1917	26.2	13.8	88.5				39.7	65.5	25.1	3.3
1918	26.1	15.6	89.8				40.4	77.7	19.0	3.1
1919	23.5	12.7	89.9				40.0	68.8	25.4	4.2
1920	25.1	14.2	93.1				40.9	86.2	27.7	4.7
1921	25.4	11.7	79.0				38.2	63.0	21.9	4.1
1922	23.1	11.2	74.7				42.0	61.2	22.3	3.9
1923	23.1	12.3	80.4				39.3	62.7	24.7	4.4
1924	23.7	11.4	72.2	41.9	30.2	66.7	37.7	64.8	24.1	4.5
1925	23.3	11.6	75.7	40.6	35.1	64.9	37.1	63.5	21.7	4.5
1926	22.5	12.4	77.5	41.2	36.3	66.3	38.8	64.2	18.7	4.5
1927	22.3	11.3	67.7	39.2	28.5	65.5	38.4	66.7	16.2	4.7
1928	21.2	11.9	69.8	38.4	31.5	65.2	38.0	61.9	16.2	4.6
1929	20.9	11.9	66.9	38.3	28.7	64.6	37.6	62.5	15.6	5.1
1930	20.4	10.6	62.8	36.6	26.2	63.5	37.6	60.4	12.2	4.4
1931	18.5	10.1	57.3	34.1	23.2	60.2	35.6	59.5	11.8	3.9
1932	17.3	10.1	54.3	32.8	21.5	59.0	35.0	57.8	11.6	3.2
1933	16.2	9.8	50.9	32.2	18.7	58.9	34.5	55.5	13.3	3.1
1934	16.8	10.1	52.1	32.4	19.8	55.2	31.1	53.6	17.3	4.0
1935	17.3	10.1	47.7	29.2	18.5	53.6	31.1	50.1	17.9	4.3
1936	17.4	10.8	50.6	29.9	20.7	51.9	29.7	48.0	18.5	4.5
1937	17.8	10.4	47.8	29.5	18.3	52.2	29.6	35.6	18.7	4.9
1938	18.7	9.8	44.5	28.2	16.3	50.0	28.2	35.6	11.6	4.1
1939	18.1	10.0	41.8	27.5	14.4	48.5	27.2	29.6	14.5	4.4

TABLE 4.2 (continued)

Year	Live Births	DEATHS							PERSONS	
		All Ages	Under 1 Year	Under 28 Days[2]	28-364 Days	Peri-natal	Fetal	Maternal	Married	Divorced
1940	18.9	9.9	40.6	26.5	14.1	46.7	26.3	29.5	17.6	4.6
1941	19.8	9.7	38.8	25.0	13.8	45.3	25.8	27.7	18.8	4.9
1942	22.4	9.5	37.1	24.9	12.2	43.9	24.7	21.0	18.6	5.1
1943	23.3	10.6	38.3	23.7	14.5	43.2	25.6	18.9	16.5	5.7
1944	21.1	10.0	38.1	24.5	13.6	44.1	25.3	17.4	15.5	6.8
1945	20.5	9.9	35.9	23.9	12.0	42.9	24.2	14.9	17.8	7.8
1946	24.3	9.6	32.8	24.0	8.8	42.2	22.9	11.8	27.6	10.2
1947	26.4	9.4	31.5	22.9	8.6	40.2	21.4	10.8	23.5	7.1
1948	24.8	9.1	30.0	21.8	8.2	38.0	20.4	7.8	20.0	5.2
1949	24.6	9.0	28.9	20.7	8.2	36.0	19.1	6.7	16.7	5.1
1950	25.1	9.0	26.3	19.0	7.3	35.4	19.3	5.7	18.3	5.0
1951	26.3	9.0	26.1	19.1	7.0	34.7	18.3	5.5	16.3	4.7
1952	26.5	8.6	26.4	19.2	7.2	34.6	18.1	4.6	15.1	4.4
1953	26.7	9.1	25.8	18.5	7.3	33.2	17.4	4.3	15.6	4.8
1954	27.3	8.6	25.0	18.5	6.4	32.8	16.9	4.9	14.6	4.6
1955	27.1	8.7	24.8	18.9	5.9	32.0	15.4	3.1	15.4	4.9
1956	27.4	8.6	24.5	18.4	6.1	31.8	15.7	4.1	15.2	4.3
1957	26.7	8.5	24.4	18.6	5.8	31.5	15.1	3.8	14.1	4.0
1958	25.8	8.4	24.6	18.7	5.9	31.7	15.3	3.4	14.0	3.6
1959	24.9	8.4	24.4	18.5	5.9	31.1	14.8	3.6	14.8	4.1
1960	24.9	8.7	24.1	18.4	5.8	31.5	15.4	3.8	15.6	4.3
1961	24.4	8.5	23.9	18.0	5.9	30.0	14.2	4.0	16.0	4.1
1962	23.0	8.8	23.9	17.8	6.1	30.6	14.8	3.1	16.4	4.4
1963	22.3	9.0	23.2	17.4	5.8	29.8	14.2	4.0	17.0	4.4
1964	21.6	8.9	23.1	17.5	5.6	29.8	14.1	3.5	18.2	4.8
1965	20.3	9.0	23.6	17.5	6.2	30.4	14.9	3.2	19.8	5.0
1966	19.9	9.0	23.6	17.1	5.6	29.2	13.8	3.3	20.2	5.2
1967	18.9	8.7	22.1	16.7	5.4	28.4	13.5	3.2	19.6	5.6
1968	18.3	8.9	21.6	16.5	5.2	27.8	13.0	2.8	21.0	5.9
1969	19.0	8.8	20.2	15.4	4.9	26.7	13.1	1.6	21.4	6.5
1970	19.3	8.6	20.3	15.6	4.7	26.0	12.0	1.7	20.7	6.7
1971	18.1	8.6	19.5	14.9	4.6	25.2	11.9	2.0	20.5	7.1
1972	16.3	8.8	19.1	14.4	4.7	24.9	12.1	2.4	20.9	7.9
1973	15.6	8.7	18.1	13.4	4.7	23.7	11.9	1.8	20.8	8.2
1974	15.1	8.4	17.4	12.6	4.8	21.2[4]	10.5[4]	1.4	19.3	8.8[3]
1975	14.7	8.2	16.5	11.7	4.8	19.8[4]	10.1[4]	1.2	18.2	9.0
1976	14.4	8.3	15.1	10.8	4.2	18.8[4]	9.6[4]	1.1	18.2	9.5
1977	15.1	8.1	14.1	9.9	4.2	17.6	9.3	0.8	18.8	9.4
1978	15.1	8.1	13.9	9.2	4.7	16.6	8.8	1.1	19.2	9.8
1979	15.6	7.9	13.3	9.0	4.3	16.0	8.4	0.8	19.3	9.6
1980	15.7	8.1	12.8	8.8	3.9	15.6	8.1	1.1	18.8	9.7
1981	15.2	8.2	13.2	9.1	4.1	15.5	7.7	0.5	18.4	9.3

[1]-1971-1979 birth, death, marriage and divorce rates have been recalculated using revised population estimates.
[2]-For years prior to 1950 deaths under 1 month of age are included in deaths under 28 days.
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TABLE 4.3

NUMBER OF LIVE BIRTHS BY AGE OF MOTHER
MICHIGAN RESIDENTS, 1920-1981

YEAR	AGE OF MOTHER									
	ALL AGES[1]	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+	AGE NOT STATED
1920	92,740	34	8,129	26,344	26,251	17,521	10,427	3,523	336	175
1921	96,322	39	8,747	26,583	27,292	18,433	11,150	3,572	337	169
1922	90,209	28	8,125	24,575	25,154	17,690	10,584	3,485	343	225
1923	93,066	37	8,725	25,887	25,459	18,072	10,770	3,476	382	258
1924	98,025	38	9,877	28,000	25,781	18,707	11,395	3,682	321	224
1925	99,220	62	10,248	28,116	26,204	18,869	11,406	3,695	379	241
1926	98,781	76	10,496	28,479	25,876	18,444	11,219	3,568	354	269
1927	100,178	59	10,685	29,302	25,707	18,790	11,287	3,722	332	294
1928	97,797	54	10,788	28,895	25,003	17,953	10,913	3,558	315	318
1929	99,134	56	11,312	30,582	25,557	16,957	10,555	3,523	293	299
1930	99,325	60	11,476	29,956	25,861	17,125	10,684	3,582	291	290
1931	90,929	61	10,109	27,255	23,806	15,937	9,905	3,317	302	237
1932	85,736	62	9,297	25,686	22,608	14,988	9,314	3,250	291	240
1933	80,923	52	8,642	23,874	21,618	14,298	8,795	3,173	261	210
1934	83,925	48	9,039	25,458	22,507	14,968	8,391	3,050	259	205
1935	87,446	47	9,808	27,631	22,938	15,026	8,473	3,029	284	210
1936	88,427	53	9,764	28,681	23,584	14,814	8,194	2,866	274	197
1937	91,539	54	10,524	30,532	24,366	15,022	7,949	2,653	242	197
1938	96,963	64	11,024	32,581	26,116	15,690	8,397	2,698	253	140
1939	94,302	51	10,368	31,036	26,095	15,976	8,021	2,416	209	130
1940	99,021	51	10,671	32,960	27,860	16,549	8,146	2,390	202	192
1941	107,458	50	11,309	36,833	31,067	17,132	8,351	2,361	200	155
1942	123,886	66	12,721	43,947	36,034	19,367	8,985	2,445	202	119
1943	125,778	67	11,934	41,627	37,773	21,449	9,980	2,615	184	149
1944	114,700	76	10,113	36,096	33,654	21,094	10,636	2,714	182	135
1945	112,655	73	9,294	32,790	33,143	22,831	11,185	2,970	229	140
1946	139,277	72	10,899	45,999	41,985	25,184	11,811	3,002	223	102
1947	161,085	91	15,594	55,954	47,793	26,296	12,009	3,073	182	93
1948	154,730	95	16,245	53,520	45,059	25,268	1 ,391	2,888	173	91
1949	157,178	117	16,404	53,608	46,363	25,971	11,565	2,906	181	63
1950	160,955	111	16,310	53,442	48,186	27,422	12,392	2,831	169	92
1951	173,506	104	17,974	57,340	52,044	29,674	13,086	3,040	160	84
1952	178,634	134	17,206	58,012	54,198	31,756	13,880	3,176	220	52
1953	182,810	166	18,510	58,070	54,734	32,948	14,798	3,350	190	44
1954	192,332	208	20,522	60,776	55,962	35,152	15,862	3,598	220	32
1955	196,623	195	21,417	61,952	56,462	35,968	16,554	3,862	198	15
1956	206,226	192	22,808	66,332	58,392	36,870	17,282	4,172	164	14
1957	208,808	190	23,798	67 086	58,424	36,980	17,956	4,160	200	14
1958	202,900	222	23,034	65,834	55,130	36,278	17,892	4,296	196	18
1959	198,576	200	21,922	65,426	53,434	34,934	18,030	4,424	198	8

TABLE 4.3 (continued)

YEAR	AGE OF MOTHER									
	ALL AGES[1]	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+	AGE NOT STATED
1960	195,056	186	22,786	65,108	51,842	33,228	17,410	4,288	202	6
1961	192,825	212	23,891	64,336	50,277	32,456	17,067	4,363	203	20
1962	182,790	268	22,702	62,243	47,109	29,817	16,160	4,250	224	17
1963	178,871	210	21,686	62,834	46,063	28,364	15,117	4,359	229	9
1964	175,103	264	22,526	62,196	44,671	26,542	14,509	4,162	220	13
1965	166,464	267	24,653	59,439	40,693	23,767	13,528	3,886	211	20
1966	165,794	310	28,690	60,711	39,225	21,205	11,846	3,547	223	37
1967	162,756	316	27,267	61,541	40,052	19,840	10,479	3,059	178	24
1968	159,058	400	26,390	60,072	41,561	18,613	9,095	2,739	163	25
1969	165,760	421	28,061	63,376	44,615	18,535	8,157	2,433	134	28
1970	171,667	489	29,764	65,892	46,262	19,003	7,904	2,223	118	12
1971	162,244	472	28,480	62,367	43,639	18,258	6,975	1,926	113	14
1972	146,854	503	28,108	54,199	40,442	16,133	5,805	1,555	95	14
1973	141,550	569	27,808	51,284	39,845	15,520	5,163	1,277	62	22
1974	137,414	501	25,977	49,975	40,215	15,317	4,291	1,063	50	25
1975	133,931	463	24,509	48,675	40,061	14,891	4,273	982	54	23
1976	131,378	404	22,593	47,161	41,412	14,893	4,053	799	47	16
1977	138,416	426	22,585	49,740	43,346	17,293	4,178	771	51	26
1978	138,802	345	21,487	49,498	43,744	18,367	4,562	729	50	20
1979	144,452	355	21,239	51,319	46,084	19,962	4,720	715	41	17
1980	145,162	331	20,000	51,218	47,113	21,024	4,692	740	22	22
1981	140,579	300	18,397	47,737	46,527	22,178	4,701	695	34	10

[1]-Total live births for the years 1920 through 1959 differ from figures in Table 4.1 as they are derived from outside sources. Live births by age of mother were not tabulated in Michigan prior to 1960. These data were obtained from the following sources:

1920-1923:	Unpublished tables from the National Center for Health Statistics.
1924-1932:	Bureau of the Census publication, Birth, Stillbirth and Infant Mortality Statistics for Birth Registration Areas of the United States.
1933-1936:	Unpublished tables from the National Center for Health Statistics.
1937-1949:	Bureau of the Census publication, Vital Statistics of the United States series.
1950-1959:	Department of Health Education and Welfare publication, Vital Statistics of the United States series.

TABLE 4.4

LIVE BIRTH RATES BY AGE OF MOTHER
MICHIGAN RESIDENTS, 1920-1981[1]

(Live birth rates are per 1,000 women per year. Total fertility rate is total children to 1,000 women in their lifetime assuming constant live birth rates.)

Year	AGE OF MOTHER								Total Fertility Rate
	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+[2]	
1920	0.2	55.7	173.1	164.0	124.2	83.8	34.3	3.8	3,195.5
1921	0.2	56.9	167.3	165.5	125.8	84.8	32.8	3.6	3,184.5
1922	0.2	50.8	149.6	149.1	117.3	77.1	30.7	3.5	2,891.5
1923	0.2	52.6	152.6	147.5	116.5	75.4	29.3	3.8	2,889.5
1924	0.2	57.4	160.0	146.1	117.3	76.7	29.9	3.1	2,953.5
1925	0.3	57.4	155.9	145.4	115.2	73.9	28.8	3.5	2,902.0
1926	0.4	56.9	153.3	140.5	109.7	70.1	26.8	3.2	2,804.5
1927	0.3	56.0	153.3	136.8	108.9	68.1	27.0	2.9	2,766.5
1928	0.2	54.8	147.1	130.3	101.5	63.7	25.0	2.6	2,626.0
1929	0.2	55.7	151.5	130.6	93.6	59.6	23.9	2.4	2,587.5
1930	0.3	55.2	145.5	130.2	92.8	58.9	23.7	2.3	2,544.5
1931	0.3	47.8	130.4	118.3	85.3	54.3	21.5	2.3	2,301.0
1932	0.3	43.4	121.5	111.2	79.4	50.8	20.8	2.2	2,148.0
1933	0.2	39.7	111.6	105.2	75.0	47.7	20.0	1.9	2,006.5
1934	0.2	41.0	117.6	108.4	77.8	45.3	18.9	1.8	2,055.0
1935	0.2	43.9	126.2	109.4	77.4	45.5	18.5	2.0	2,115.5
1936	0.2	43.1	129.5	111.4	75.5	43.8	17.3	1.8	2,113.0
1937	0.2	45.9	136.4	113.9	75.9	42.3	15.8	1.6	2,160.0
1938	0.3	47.4	143.9	120.9	78.5	44.4	15.8	1.6	2,264.0
1939	0.2	44.1	135.6	119.6	79.2	42.3	14.0	1.3	2,181.5
1940	0.2	44.9	142.8	126.8	81.5	42.8	13.7	1.2	2,269.5
1941	0.2	48.1	157.8	137.1	81.6	42.5	13.2	1.2	2,408.5
1942	0.3	54.5	186.6	155.3	89.9	44.7	13.4	1.2	2,729.5
1943	0.3	51.6	175.1	159.0	97.1	48.6	14.1	1.1	2,734.5
1944	0.3	44.1	150.5	138.5	93.2	50.6	14.3	1.0	2,462.5
1945	0.3	40.8	135.5	133.4	98.5	52.1	15.4	1.3	2,386.5
1946	0.3	48.3	188.5	165.3	106.2	53.8	15.3	1.2	2,894.5
1947	0.4	69.7	227.3	184.2	108.4	53.6	15.4	1.0	3,300.0
1948	0.4	73.2	215.5	170.0	101.9	49.8	14.2	1.0	3,130.0
1949	0.5	74.6	214.0	171.4	102.5	49.6	14.1	1.0	3,138.5
1950	0.5	74.6	212.0	175.5	106.5	52.3	13.6	0.9	3,179.5
1951	0.4	79.1	229.0	192.2	114.4	53.9	14.1	0.8	3,419.5
1952	0.5	73.5	233.0	202.5	121.7	56.1	14.4	1.1	3,514.0
1953	0.6	76.8	234.5	207.0	125.5	58.7	14.9	0.9	3,594.5
1954	0.7	82.8	246.8	214.1	133.1	61.8	15.6	1.1	3,780.0
1955	0.6	84.1	253.0	218.6	135.4	63.4	16.4	0.9	3,862.0
1956	0.6	87.2	272.4	228.9	138.0	65.0	17.4	0.8	4,051.5
1957	0.6	88.6	277.1	231.8	137.6	66.4	17.0	0.9	4,100.0
1958	0.6	83.6	273.4	221.5	134.3	65.0	17.2	0.9	3,982.5

TABLE 4.4 (continued)

Year	AGE OF MOTHER								Total Fertility Rate
	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+[2]	
1959	0.6	77.6	273.3	217.4	128.6	64.4	17.3	0.9	3,900.5
1960	0.5	79.3	273.1	213.0	121.8	61.4	16.6	0.9	3,833.0
1961	0.6	78.1	252.0	200.7	120.2	61.3	16.8	0.9	3,653.0
1962	0.7	70.7	231.5	183.9	111.4	58.9	16.3	0.9	3,371.5
1963	0.5	64.6	222.5	175.9	107.0	55.9	16.6	0.9	3,219.5
1964	0.6	64.2	210.1	167.0	101.0	54.4	15.8	0.9	3,070.0
1965	0.6	67.4	192.0	149.0	91.2	51.5	14.7	0.8	2,836.0
1966	0.7	75.4	187.9	140.7	82.1	45.8	13.4	0.9	2,734.5
1967	0.7	69.0	182.8	140.8	77.6	41.2	11.5	0.7	2,621.5
1968	0.9	64.3	171.5	143.2	73.4	36.3	10.2	0.6	2,502.0
1969	0.9	66.0	174.2	150.8	73.8	33.1	9.1	0.5	2,542.0
1970	1.0	68.2	176.2	154.2	76.2	32.4	8.3	0.4	2,584.5
1971	1.0	64.7	161.7	138.6	69.1	27.9	7.2	0.4	2,353.0
1972	1.1	63.7	137.6	124.1	58.6	22.8	5.9	0.4	2,071.0
1973	1.2	62.8	127.5	118.3	54.2	19.9	4.9	0.2	1,945.0
1974	1.1	58.5	121.9	115.7	51.5	16.3	4.1	0.2	1,846.5
1975	1.1	55.3	117.0	112.3	48.4	16.0	3.9	0.2	1,771.0
1976	0.9	51.1	111.6	113.0	46.9	15.0	3.2	0.2	1,709.5
1977	1.0	50.9	115.5	114.9	52.6	15.2	3.1	0.2	1,767.0
1978	0.8	48.3	112.7	112.6	54.0	16.3	3.0	0.2	1,739.5
1979	0.9	47.6	114.6	115.2	56.7	16.6	3.0	0.2	1,774.0
1980	0.8	44.8	113.1	115.6	58.4	16.4	3.1	0.1	1,761.5
1981	0.8	42.7	105.4	112.1	58.0	15.9	2.9	0.2	1,690.0

[1]-1971-1979 rates have been recalculated using revised population estimates.

[2]-Number of live births to women aged 45 and over per 1,000 women 45-49 years of age.

SOURCE: Population figures used for 1920-1970 rates are from General Population Characteristics, Michigan, USBC, 1971, with arithmetic extrapolation between census years. For 1971-1981 population source, see Technical Notes.

TABLE 4.5
REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES
MICHIGAN RESIDENTS, 1900-1981

Year	DIPTHERIA	STREP. SORE THROAT (INC. SCARLET FEVER)	SMALLPOX	TYPHOID FEVER	WHOOPING COUGH	MEASLES	HEPATITIS, INFECTIOUS AND SERUM	TB[2] (ALL FORMS)	MENINGOCOCCAL INFECTIONS[1]	POLIO	SYPHILIS	GONORRHEA	CHANCROID
1900	2,706	6,734	694	5,122	3,375	20,356		2,721	654				
1901	2,498	7,726	5,088	3,002	2,955	4,629		2,915	506				
1902	2,993	6,582	7,086	2,456	3.534	11,978		2,658	528				
1903	3,670	5,353	6,341	2,840	4,172	8,941		2,745	525				
1904	3,510	4,088	5,753	3,028	1,779	10,386		2,928	448				
1905	2,159	2,286	2,985	2,774	1,196	6,061		2,590	577				
1906	3,648	3,066	1,240	3,163	1,364	7,403		2,653	533				
1907	2,935	2,514	1,712	1,953	872	12,139		2,699	575				
1908	26,58	3,087	2,306	2,656	1,248	4,775		2,705	487				
1909	3,109	5,153	1,533	2,694	1,054	9,047		3,423	457				
1910	3,433	6,501	3,319	3,361	1,136	13,934		4,415	522	104			
1911	3,762	5,177	898	2,660	1,897	9,639		5,254	478	68			
1912	3,294	4,533	1,127	2,847	1.255	2,834		1,958	88	78			
1913	5,505	4,140	1,995	2,253	929	9,185		1,920	165	56			
1914	5,149	3,769	1,527	2,167	1,822	11,356		2,566	205	49			
1915	4,386	3,402	1,094	1,956	2.258	4,438		3,648	107	95			
1916	5,625	6,932	1,581	2,513	1,837	12,143		7,076	163	598			
1917	8,499	14,322	3,674	1,723	3,211	14,472		4,856	75	91			
1918	6,128	5,944	5,241	1,339	2,563	6,726		3,655	95	121			
1919	7,896	6,269	2,381	1,254	1,829	8,885		4,231	75	155	5,077	7,910	186
1920	10,360	10,280	4,818	1,421	7,171	22,364		4,994	203	67	8,117	11,463	262
1921	12,075	10,893	4,512	1,837	6,696	3,043		5,708	173	483	7,421	9,774	153
1922	8,513	9,687	1,230	1,108	5,642	12,107		5,573	159	43	7,900	9,717	90
1923	7,725	12,868	2,311	982	7,617	30,041		5,471	186	39	10,480	9,597	235
1924	6,011	12,989	4,527	782	4,364	18,290		5,570	157	647	13,000	10,490	183
1925	3,925	12,303	784	962	7,576	10,332		5,785	128	99	14,668	10,660	104
1926	5,377	12,681	549	583	8,776	39,946		5,387	96	107	14,872	10,707	103
1927	4,575	11,011	1,467	581	6,818	8,303		5,406	138	282	15,713	9,318	107
1928	3,724	10,486	1,335	390	9,700	27,039		5,885	276	77	15,323	8,592	100
1929	4,618	14,245	2,410	310	9,340	18,040		6,248	1,864	180	16,606	9,661	333
1930	3,206	11,174	2,375	504	7,937	28,129		5,128	901	208	16,538	8,554	163
1931	1,831	13,023	915	424	11,448	6,212		6,132	293	1,137	14,662	7,843	170
1932	1,188	15,255	222	513	13,091	42.129		7,103	129	112	11,969	6,963	140
1933	1,152	16,419	46	453	11,720	21,654		6,624	86	93	7,691	6,447	85
1934	614	19,238	49	486	11,255	6,528		5,264	53	230	6,483	6,188	132
1935	645	11,849	16	355	13,427	79,061		4,642	113	614	6,416	6,372	110
1936	661	12,650	32	287	14,287	2,453		5,157	120	152	6,401	6,460	133
1937	842	24,798	152	241	11,426	6,154		6,469	87	421	8,708	7,072	244
1938	619	18,362	274	285	14,563	79,400		6,335	69	59	14,684	7,046	341
1939	452	15,836	371	177	8,997	12.948		6,119	46	904	13,144	6,364	286
1940	264	10,366	76	120	11,757	20,206		6,063	49	1,228	9,999	7,650	218
1941	242	8,756	114	147	16,512	70,748		5,371	49	270	11,370	8,767	359
1942	243	7,503	17	74	11,602	8,569		5,720	66	162	12,461	8,753	276
1943	281	5,044	18	115	12,091	51,764		6,546	757	255	15,933	9,526	260

TABLE 4.5 (continued)

Year	DIPTHERIA	STREP. SORE THROAT (INC. SCARLET FEVER)	SMALLPOX	TYPHOID FEVER	WHOOPING COUGH	MEASLES	HEPATITIS, INFECTIOUS AND SERUM	TB[2] (ALL FORMS)	MENINGOCOCCAL INFECTIONS[1]	POLIO	SYPHILIS	GONORRHEA	CHANCROID
1944	419	8,963	10	78	4,049	26,711		6,419	857	884	17,288	11,987	185
1945	630	9,304	16	59	5,339	6,328	134	5,471	270	215	16,046	12,565	244
1946	385	5,977	3	85	8,116	42,261	34	5,548	185	1,091	18,051	12,635	206
1947	238	4,834	1	77	10,472	9,574	14	6,470	113	646	15,276	10,989	216
1948	126	5,934	-	49	2,668	42,952	9	6,109	107	775	12,100	9,448	465
1949	119	8,852	-	48	4,157	20,279	28	5,953	120	2,909	8,740	9,427	336
1950	84	4,665	-	43	9,184	38,245	48	5,538	133	2,029	8,830	8,678	202
1951	48	8,181	-	33	3,156	15,227	325	6,144	138	1,463	6,532	8,494	187
1952	45	8,325	-	53	1,992	32,941	283	6,152	169	3,912	7,377	7,691	58
1953	12	5,885	-	31	2,932	23,334	868	5,643	151	2,346	5,619	8,790	43
1954	57	5,142	-	30	5,620	40,725	1,419	5,764	150	2,168	4,686	9,940	47
1955	59	5,880	-	24	4,249	23,882	1,244	5,488	170	1,177	4,865	10,306	58
1956	220	7,349	-	56	1,907	41,966	814	5,515	182	656	4,785	9,598	52
1957	130	7,193	-	12	1,363	19,070	657	5,011	175	498	4,571	8,428	97
1958	6	5,380	-	18	1,233	41,448	688	5,587	228	1,228	4,267	8,621	178
1959	3	9,452	-	8	3,001	12,234	1,136	4,743	141	448	3,421	8,033	136
1960	9	9,287	-	14	1,129	36,161	2,113	4,127	169	88	3,647	8,372	112
1961	3	8,347	-	7	639	29,391	4,607	3,838	253	40	3,309	9,505	102
1962	4	8,116	-	12	1,756	25,303	3,280	3,474	139	21	4,331	11,654	75
1963	5	11,964	-	14	1,410	48,752	2,661	3,298	104	18	5,512	11,043	98
1964	1	17,228	-	13	957	30,897	2,472	3,047	80	3	5,220	12,028	106
1965	-	14,622	-	7	612	28,132	2,625	3,069	107	1	5,638	14,319	95
1966	1	13,862	-	7	653	15,251	2,589	3,259	135	1	5,842	15,424	114
1967	1	13,269	-	8	1,058	1,048	1,915	2,951	76	3	5,581	17,088	78
1968	-	10,101	-	1	429	353	2,356	2,618	94	3	5,351	18,153	105
1969	-	9,763	-	6	192	401	3,359	2,133	114	1	3,809	18,534	103
1970	-	11,863	-	14	195	1,834	4,594	1,992	69	2	3,920	20,359	118
1971	1	11,244	-	10	140	2,659	4,828	1,789	64	-	4,800	22,260	93
1972	1	13,304	-	7	116	2,353	4,322	1,632	55	1	4,891	24,750	175
1973	-	24,467	-	14	86	4,552	3,872	1,473	54	-	4,375	31,086	217
1974	-	31,802	-	11	104	2,365	3,599	1,431	54	2	2,722	32,067	171
1975	1	23,777	-	10	98	3,253	2,877	1,271	76	-	1,638	32,583	98
1976	-	24,937	-	10	70	6,139	2,645	1,349	65	1	1,089	34,836	37
1977	-	31,047	-	13	73	1,392	2,686	1,290	51	-	1,185	36,794	61
1978	-	29,759	-	15	47	8,006	2,174	1,260	87	1	1,133	36,647	49
1979	-	30,182	-	14	102	869	2,036	1,052	79	-	1,260	36,624	59
1980	1	24,808	-	12	38	250	1,799	1,168	77	1	1,163	34,951	50
1981	-	13,529	-	26	30	34	1,700	931	93	-	1,053	32,524	32

[1]-Meningococcal infections - Prior to 1952 data were for meningococcic meningitis.

[2]-Effective January 1975, a new diagnostic classification system for tuberculosis was adopted. As a result, case counts and rates prior to 1975 are not directly comparable to the figures in 1975 and later years.

SOURCE: Bureau of Disease Control and Laboratory Services, Division of Epidemiology, MDPH.

TABLE 4.6
CASE RATES OF CERTAIN REPORTED COMMUNICABLE DISEASES
MICHIGAN RESIDENTS, 1900-1981
(Rates per 100,000 population)

Year	DIPTHERIA	STREP. SORE THROAT (INC. SCARLET FEVER)	SMALLPOX	TYPHOID FEVER	WHOOPING COUGH	MEASLES	HEPATITIS, INFECTIOUS AND SERUM	TB[2] (ALL FORMS)	MENINGOCOCCAL INFECTIONS[1]	POLIO	SYPHILIS	GONORRHEA	CHANCROID
1900	111.8	278.2	28.7	211.6	139.4	840.8		112.4	27.0				
1901	101.5	314.1	206.8	122.0	120.1	188.2		118.5	20.6				
1902	119.8	263.4	283.6	98.3	141.4	479.3		106.4	21.1				
1903	144.6	210.9	249.9	111.9	164.4	352.3		108.2	20.7				
1904	136.2	158.7	223.3	117.5	69.0	403.1		113.6	17.4				
1905	82.5	87.4	114.1	106.1	45.7	231.7		99.0	22.1				
1906	137.4	115.5	46.7	119.2	51.4	278.9		99.9	20.1				
1907	109.0	93.3	63.6	72.5	32.4	450.7		100.2	21.3				
1908	97.3	113.0	84.4	97.2	45.7	174.8		99.0	17.8				
1909	112.2	185.9	55.3	97.2	38.0	326.5		123.5	16.5				
1910	122.2	231.3	118.1	119.6	40.4	495.8		157.1	18.6	3.7			
1911	129.9	178.8	31.0	91.8	65.5	332.8		181.4	16.5	2.3			
1912	110.5	152.0	37.8	95.5	42.1	95.0		65.7	3.0	2.6			
1913	179.5	135.0	65.0	73.4	30.3	299.4		62.6	5.4	1.8			
1914	163.3	119.5	48.4	68.7	57.8	360.1		81.4	6.5	1.6			
1915	135.4	105.0	33.8	60.4	69.7	137.0		112.6	3.3	2.9			
1916	169.2	208.5	47.5	75.6	55.2	365.2		212.8	4.9	18.0			
1917	249.2	419.9	107.7	50.5	94.1	424.3		142.4	2.2	2.7			
1918	175.2	170.0	149.9	38.3	73.3	192.4		104.5	2.7	3.5			
1919	220.4	175.0	66.5	35.0	51.1	248.0		118.1	2.1	4.3	141.7	220.8	5.2
1920	282.4	280.2	131.3	38.7	195.5	609.6		136.1	5.5	1.8	221.3	312.5	7.1
1921	318.9	287.7	119.2	48.5	176.9	80.4		150.8	4.6	12.8	196.0	258.2	4.0
1922	218.1	248.2	31.5	28.4	144.5	310.2		142.8	4.1	1.1	202.4	248.9	2.3
1923	192.1	320.1	57.5	24.4	189.5	747.2		136.1	4.6	1.0	260.7	238.7	5.8
1924	145.3	313.9	109.4	18.9	105.5	442.0		134.6	3.8	15.6	314.2	253.5	4.4
1925	92.2	289.1	18.4	22.6	178.0	242.8		135.9	3.0	2.3	344.7	250.5	2.4
1926	123.0	290.0	12.6	13.3	200.7	913.5		123.2	2.2	2.4	340.1	244.9	2.4
1927	101.9	245.2	32.7	12.9	151.8	184.9		120.4	3.1	6.3	349.9	207.5	2.4
1928	80.8	227.6	29.0	8.5	210.5	586.9		127.7	6.0	1.7	332.6	186.5	2.2
1929	97.7	301.5	51.0	6.6	197.7	381.8		132.2	39.4	3.8	351.4	204.5	7.0
1930	66.2	230.8	49.0	10.4	163.9	580.9		105.9	18.6	4.3	341.5	176.6	3.4
1931	37.5	266.7	18.7	8.7	234.4	127.2		125.6	6.0	23.3	300.2	160.6	3.5
1932	24.1	309.7	4.5	10.4	265.8	855.4		144.2	2.6	2.3	243.0	141.4	2.8
1933	23.2	330.6	0.9	9.1	236.0	436.0		133.4	1.7	1.9	154.9	129.8	1.7
1934	12.3	384.2	1.0	9.7	224.8	130.4		105.1	1.1	4.6	129.5	123.6	2.6
1935	12.8	234.7	0.3	7.0	265.9	1,565.8		91.9	2.2	12.2	127.1	126.2	2.2
1936	13.0	248.5	0.6	5.6	280.7	48.2		101.3	2.4	3.0	125.7	126.9	2.6
1937	16.4	483.2	3.0	4.7	222.6	119.9		126.1	1.7	8.2	169.7	137.8	4.8
1938	12.0	354.9	5.3	5.5	281.5	1,534.8		122.5	1.3	1.1	283.8	136.2	6.6
1939	8.7	303.7	7.1	3.4	172.5	248.3		117.3	0.9	17.3	252.0	122.0	5.5
1940	5.0	197.2	1.4	2.3	223.7	384.4		115.3	0.9	23.4	190.2	145.5	4.1
1941	4.5	161.0	2.1	2.7	303.7	1,301.1		98.8	0.9	5.0	209.1	161.2	6.6
1942	4.4	135.5	0.3	1.3	209.5	154.7		103.3	1.2	2.9	225.0	158.0	5.0

TABLE 4.6 (continued)

Year	DIP-THERIA	STREP. SORE THROAT (INC. SCARLET FEVER)	SMALL-POX	TYPHOID FEVER	WHOOP-ING COUGH	MEASLES	HEPATITIS, INFECTIOUS AND SERUM	TB [2] (ALL FORMS)	MENINGOCOCCAL INFECTIONS [1]	POLIO	SYPHILIS	GONORRHEA	CHANCROID
1943	5.2	93.8	0.3	2.1	224.8	962.6		121.7	14.1	4.7	296.3	177.1	4.8
1944	7.8	166.7	0.2	1.5	75.3	496.7		119.4	15.9	16.4	321.5	222.9	3.4
1945	11.6	171.2	0.3	1.1	98.2	116.4	2.5	100.7	5.0	4.0	295.2	231.2	4.5
1946	6.7	104.7	0.1	1.5	142.2	740.3	0.6	97.2	3.2	19.1	316.2	221.3	3.6
1947	3.9	79.6	0.0	1.3	172.5	157.8	0.2	106.6	1.9	10.6	251.7	181.1	3.6
1948	2.0	95.8	-	0.8	43.1	693.3	0.1	98.6	1.7	12.5	195.3	152.5	7.5
1949	1.9	139.4	-	0.8	65.4	319.3	0.4	93.7	1.9	45.8	137.6	148.4	5.3
1950	1.3	73.2	-	0.7	144.1	600.2	0.8	86.9	2.1	31.8	138.6	136.2	3.2
1951	0.7	125.0	-	0.5	48.2	232.7	5.0	93.9	2.1	22.4	99.8	129.8	2.9
1952	0.7	124.1	-	0.8	29.7	491.1	4.2	91.7	2.5	58.3	110.0	114.7	0.9
1953	0.2	85.9	-	0.5	42.8	340.5	12.7	82.4	2.2	34.2	82.0	128.3	0.6
1954	0.8	73.2	-	0.4	80.0	579.8	20.2	82.1	2.1	30.9	66.7	141.5	0.7
1955	0.8	81.3	-	0.3	58.7	330.0	17.2	75.8	2.3	16.3	67.2	142.4	0.8
1956	2.9	97.8	-	0.7	25.4	558.4	10.8	73.4	2.4	8.7	63.7	127.7	0.7
1957	1.7	92.2	-	0.2	17.5	244.4	8.4	64.2	2.2	6.4	58.6	108.0	1.2
1958	0.1	68.4	-	0.2	15.7	526.9	8.7	71.0	2.9	15.6	54.2	109.6	2.3
1959	0.0	118.7	-	0.1	37.7	153.7	14.3	59.6	1.8	5.6	43.0	100.9	1.7
1960	0.1	118.7	-	0.2	14.4	462.2	27.0	52.8	2.2	1.1	46.6	107.0	1.4
1961	0.0	105.6	-	0.1	8.1	371.9	58.3	48.6	3.2	0.5	41.9	120.3	1.3
1962	0.1	102.2	-	0.2	22.1	318.7	41.3	43.8	1.8	0.3	54.6	146.8	0.9
1963	0.1	149.0	-	0.2	17.6	607.1	33.1	41.1	1.3	0.2	68.6	137.5	1.2
1964	0.0	212.7	-	0.2	11.8	381.4	30.5	37.6	1.0	0.0	64.4	148.5	1.3
1965	-	178.3	-	0.1	7.5	343.1	32.0	37.4	1.3	0.0	68.8	174.6	1.2
1966	0.0	166.7	-	0.1	7.9	183.4	31.1	39.2	1.6	0.0	70.3	185.5	1.4
1967	0.0	154.0	-	0.1	12.3	12.2	22.2	34.2	0.9	0.0	64.8	198.4	0.9
1968	-	116.4	-	0.0	4.9	4.1	27.2	30.2	1.1	0.0	61.7	209.3	1.2
1969	-	111.8	-	0.1	2.2	4.6	38.5	24.4	1.3	0.0	43.6	212.2	1.2
1970	-	133.7	-	0.2	2.2	20.7	51.8	22.4	0.8	0.0	44.2	229.4	1.3
1971	0.0	125.3	-	0.1	1.6	29.6	53.8	19.9	0.7	-	53.5	248.1	1.0
1972	0.0	147.4	-	0.1	1.3	26.1	47.9	18.1	0.6	0.0	54.2	274.2	1.9
1973	-	269.7	-	0.2	0.9	50.2	42.7	16.2	0.6	-	48.2	342.7	2.4
1974	-	349.1	-	0.1	1.1	26.0	39.5	15.7	0.6	0.0	29.9	352.0	1.9
1975	0.0	261.1	-	0.1	1.1	35.7	31.6	14.0	0.8	-	18.0	357.7	1.1
1976	-	273.5	-	0.1	0.8	67.3	29.0	14.8	0.7	0.0	11.9	382.1	0.4
1977	-	339.1	-	0.1	0.8	15.2	29.3	14.1	0.6	-	12.9	401.8	0.7
1978	-	323.4	-	0.2	0.5	87.0	23.6	13.7	0.9	0.0	12.3	398.3	0.5
1979	-	326.3	-	0.2	1.1	9.4	22.0	11.4	0.9	-	13.6	396.0	0.6
1980	0.0	267.8	-	0.1	0.4	2.7	19.4	12.6	0.8	0.0	12.6	377.4	0.5
1981	-	145.9	-	0.3	0.3	0.4	18.3	10.0	1.0	-	11.4	350.9	0.3

[1] -Meningococcal infections - Prior to 1952 data were for meningococcic meningitis.

[2] -Effective January, 1975, a new diagnostic classification system for tuberculosis was adopted. As a result, case counts and rates prior to 1975 are not directly comparable to the figures in 1975 and later years.

SOURCE: Bureau of Disease Control and Laboratory Services, Division of Epidemiology, MDPH.

TABLE 4.7
NUMBER OF DEATHS AND DEATH RATES FOR CERTAIN COMMUNICABLE DISEASES
MICHIGAN RESIDENTS, 1900-1981

(Rates per 100,000 population)

Year	Diptheria		Strep. Sore Throat Incl. Scarlet Fever		Smallpox		Typhoid Fever		Whooping Cough		Measles		TB of the Respiratory System		Tuberculosis[2] (all forms)		Polio-myelitis		Syphilis[1]		Gonorrhea	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1900	529	21.9	272	11.2	9	0.4	869	35.9	208	8.6	342	14.1	2,018	83.4	2,500	103.3						
1901	502	20.4	312	12.7	27	1.1	645	26.2	163	6.6	79	3.2	2,152	87.5	2,548	103.6			88	3.6		
1902	504	20.2	277	11.1	42	1.7	608	24.3	289	11.6	238	9.5	2,088	83.6	2,462	98.5			114	4.6		
1903	686	27.0	200	7.9	29	1.1	606	23.9	383	15.1	176	6.9	2,155	84.9	2,562	101.0			130	5.2		
1904	515	20.0	210	8.1	26	1.0	641	24.9	148	5.7	194	7.5	2,306	89.5	2,761	107.2			101	4.0		
1905	478	18.3	123	4.7	74	2.8	636	24.3	131	5.0	123	4.7	2,288	87.5	2,732	104.5			89	3.5		
1906	472	17.8	227	8.6	3	0.1	721	27.2	469	17.7	251	9.5	2,303	86.8	2,737	103.1			89	3.4		
1907	421	15.6	159	5.9	8	0.3	594	22.1	223	8.3	256	9.5	2,338	86.8	2,728	101.3			94	3.6		
1908	343	12.6	194	7.1	11	0.4	687	25.1	305	11.2	121	4.4	2,249	82.3	2,706	99.0			118	4.5		
1909	395	14.3	275	9.9	4	0.1	653	23.6	217	7.8	270	9.7	2,237	80.7	2,629	94.9			127	4.8		
1910	495	17.6	297	10.6	121	4.3	654	23.3	318	11.3	251	8.9	2,273	80.9	2,756	98.1	52	1.9	65	2.3		
1911	473	16.3	208	7.2	7	0.2	551	19.0	254	8.8	200	6.9	2,284	78.9	2,766	95.5	55	1.9	104	3.6		
1912	465	15.6	186	6.2	3	0.1	534	17.9	252	8.5	118	4.0	2,289	76.8	2,744	92.0	48	1.7	90	3.1		
1913	676	22.0	283	9.2	5	0.2	538	17.5	292	9.5	258	8.4	2,243	73.1	2,703	88.1	43	1.5	136	4.6		
1914	507	16.1	177	5.6	2	0.1	400	12.7	304	9.6	180	5.7	2,325	73.7	2,799	88.8	41	1.4	160	5.3		
1915	354	10.9	107	3.3	5	0.2	353	10.9	236	7.3	101	3.1	2,527	78.0	2,986	92.2	36	1.2	163	5.3		
1916	507	15.2	177	5.3	2	0.1	424	12.8	228	6.9	363	10.9	2,573	77.4	3,070	92.3	141	4.6	206	6.7		
1917	851	24.9	340	10.0	9	0.3	386	11.3	360	10.6	259	7.6	2,779	81.5	3,310	97.0	44	1.4	224	7.1		
1918	686	19.6	181	5.2	18	0.5	337	9.6	496	14.2	270	7.7	3,059	87.5	3,612	103.3	58	1.8	290	9.1		
1919	764	21.3	179	5.0	10	0.3	272	7.6	172	4.8	183	5.1	2,620	73.1	3,127	87.3	80	2.2	299	8.2		
1920	888	24.2	305	8.3	14	0.4	297	8.1	511	13.9	436	11.9	2,645	72.1	3,149	85.8	30	0.8	314	8.4		
1921	954	25.2	334	8.8	12	0.3	285	7.5	316	8.3	58	1.5	2,285	60.4	2,736	72.3	100	2.6	226	5.9	14	0.4
1922	620	15.9	217	5.6	20	0.5	192	4.9	232	5.9	232	5.9	2,232	57.2	2,654	68.0	21	0.5	186	4.7	6	0.2
1923	675	16.8	304	7.6	13	0.3	202	5.0	323	8.0	258	6.4	2,410	59.9	2,837	70.6	18	0.5	262	6.8	5	0.1
1924	470	11.4	265	6.4	226	5.5	149	3.6	169	4.1	221	5.3	2,474	59.8	2,952	71.3	116	3.0	271	7.0	13	0.3
1925	358	8.4	208	4.9	22	0.5	157	3.7	260	6.1	69	1.6	2,410	56.6	2,830	66.5	31	0.7	282	6.6	27	0.6
1926	677	15.5	235	5.4	4	0.1	119	2.7	355	8.1	577	13.2	2,601	59.5	3,041	69.5	34	0.8	327	7.5	12	0.3
1927	516	11.5	168	3.7	-	-	94	2.1	201	4.5	67	1.5	2,514	56.0	2,952	65.7	69	1.5	305	6.8	16	0.4
1928	384	8.3	178	3.9	2	0.0	83	1.8	219	4.8	303	6.6	2,647	57.4	3,108	67.5	27	0.6	384	8.4	19	0.4
1929	498	10.5	145	3.1	9	0.2	81	1.7	255	5.4	146	3.1	2,685	56.8	3,140	66.5	50	1.1	397	8.4	19	0.4
1930	299	6.2	130	2.7	9	0.2	87	1.8	176	3.6	231	4.8	2,443	50.5	2,912	60.1	39	0.8	395	8.2	12	0.2
1931	172	3.5	122	2.5	4	0.1	73	1.5	190	3.9	28	0.6	2,263	46.3	2,660	54.5	108	2.2	361	7.4	3	0.1
1932	106	2.2	112	2.3	1	0.0	56	1.1	199	4.0	183	3.7	2,101	42.7	2,463	50.0	23	0.5	377	7.7	2	0.0
1933	112	2.3	157	3.2	-	-	50	1.0	153	3.1	111	2.2	1,996	40.2	2,348	47.3	5	0.1	327	6.6	7	0.1
1934	38	0.8	171	3.4	-	-	65	1.3	141	2.8	36	0.7	1,909	38.1	2,199	43.9	25	0.5	402	8.0	10	0.2
1935	58	1.1	98	1.9	-	-	34	0.7	132	2.6	184	3.6	1,741	34.5	2,044	40.5	32	0.6	393	7.8	3	0.1
1936	52	1.0	114	2.2	-	-	37	0.7	107	2.1	12	0.2	1,816	35.7	2,100	41.3	21	0.4	394	7.7	6	0.1
1937	72	1.4	148	2.9	1	0.0	29	0.6	132	2.6	11	0.2	1,860	36.2	2,119	41.3	51	1.0	401	7.8	8	0.2
1938	44	0.9	87	1.7	-	-	23	0.4	116	2.2	100	1.9	1,633	31.6	1,866	36.1	10	0.2	401	7.8	8	0.2
1939	25	0.5	69	1.3	-	-	25	0.5	76	1.5	29	0.6	1,651	31.7	1,881	36.1	40	0.8	389	7.5	4	0.1
1940	20	0.4	41	0.8	1	0.0	11	0.2	59	1.1	19	0.4	1,547	29.4	1,752	33.3	72	1.4	591	11.2	3	0.0
1941	18	0.3	32	0.6	1	0.0	14	0.3	91	1.7	65	1.2	1,532	28.2	1,723	31.7	18	0.3	537	9.9	1	0.0

Table 4.7 (continued)

Year	Diptheria		Strep. Sore Throat Incl. Scarlet Fever		Smallpox		Typhoid Fever		Whooping Cough		Measles		TB of the Respiratory System		Tuberculosis[2] (all forms)		Polio-myelitis		Syphilis[1]		Gonorrhea	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1942	24	0.4	23	0.4	-	-	5	0.1	72	1.3	8	0.1	1,630	29.4	1,827	33.0	10	0.2	559	10.1	7	0.1
1943	21	0.4	11	0.2	-	-	9	0.2	101	1.9	89	1.7	1,588	29.5	1,802	33.5	27	0.5	579	10.8	3	0.0
1944	32	0.6	7	0.1	1	0.0	7	0.1	33	0.6	49	0.9	1,544	28.7	1,748	32.5	45	0.8	543	10.1	2	0.0
1945	46	0.8	9	0.2	-	-	3	0.1	36	0.7	10	0.2	1,591	29.3	1,758	32.3	20	0.4	527	9.7	2	0.0
1946	27	0.5	3	0.1	-	-	6	0.1	44	0.8	47	0.8	1,645	28.8	1,843	32.3	89	1.6	547	9.6	-	-
1947	23	0.4	6	0.1	-	-	5	0.1	63	1.0	5	0.1	1,483	24.4	1,643	27.1	29	0.5	502	8.3	3	0.0
1948	8	0.1	1	0.0	-	-	4	0.1	9	0.1	43	0.7	1,395	22.5	1,561	25.2	54	0.9	512	8.3	-	-
1949	11	0.2	4	0.1	-	-	1	0.0	22	0.3	33	0.5	1,254	19.7	1,400	22.0	216	3.4	455	7.2	-	-
1950	2	0.0	1	0.0	-	-	5	0.1	28	0.4	28	0 4	1,134	17.8	1,270	19.9	128	2.0	325	5.1	1	0.0
1951	6	0.1	-	-	-	-	1	0.0	21	0.3	11	0.2	1,049	16.0	1,154	17.6	67	1.0	299	4.6	1	0.0
1952	2	0.0	-	-	-	-	-	-	8	0.1	17	0.3	689	10.3	775	11.6	213	3.2	174	2.6	2	0.0
1953	2	0.0	1	0.0	-	-	-	-	11	0.2	16	0.2	536	7.8	607	8.9	108	1.6	182	2.7	1	0.0
1954	3	0.0	3	0.0	-	-	-	-	17	0.2	17	0.2	471	6.7	530	7.5	89	1.3	139	2.0	2	0.0
1955	1	0.0	1	0.0	-	-	1	0.0	8	0.1	10	0.1	435	6.0	477	6.6	32	0.4	115	1.6	1	0.0
1956	6	0.1	3	0.0	-	-	-	-	6	0.1	26	0.3	426	5.7	466	6.2	22	0.3	114	1.5	4	0.1
1957	1	0.0	-	-	-	-	-	-	6	0.1	23	0.3	403	5.2	442	5.7	15	0.2	105	1.3	4	0.1
1958	-	-	-	-	-	-	-	-	1	0.0	18	0.2	357	4.5	395	5.0	37	0.5	84	1.1	8	0.1
1959	1	0.0	2	0.0	-	-	1	0.0	5	0.1	11	0.1	335	4.2	370	4.6	17	0.2	84	1.1	4	0.1
1960	2	0.0	1	0.0	-	-	-	-	1	0.0	17	0.2	364	4.7	390	5.0	4	0.1	79	1.0	7	0.1
1961	1	0.0	1	0.0	-	-	-	-	2	0.0	13	0.2	307	3.9	332	4.2	-	-	71	0.9	7	0.1
1962	2	0.0	1	0.0	-	-	-	-	2	0.0	8	0.1	307	3.9	331	4.2	2	0.0	94	1.2	3	0.0
1963	-	-	-	-	-	-	-	-	-	-	27	0.3	276	3.4	299	3.7	1	0.0	72	0.9	1	0.0
1964	-	-	-	-	-	-	-	-	2	0.0	11	0.1	288	3.6	315	3.9	1	0.0	66	0.8	3	0.0
1965	-	-	-	-	-	-	-	-	-	-	5	0.1	261	3.2	285	3.5	-	-	65	0.8	2	0.0
1966	1	0.0	-	-	-	-	-	-	-	-	7	0.1	284	3.4	301	3.6	-	-	63	0.8	-	-
1967	-	-	-	-	-	-	-	-	-	-	3	0.0	206	2.4	226	2.6	-	-	44	0.5	1	0.0
1968	-	-	1	0.0	-	-	-	-	-	-	-	-	203	2.3	262	3.0	2	0.0	29	0.3	-	-
1969	-	-	-	-	-	-	-	-	-	-	-	-	147	1.7	201	2.3	-	-	26	0.3	1	0.0
1970	-	-	2	0.0	-	-	-	-	-	-	1	0.0	134	1.5	180	2.0	-	-	17	0.2	2	0.0
1971	-	-	4	0.0	-	-	-	-	-	-	-	-	122	1.4	173	1.9	-	-	18	0.2	-	-
1972	-	-	1	0.0	-	-	1	0.0	-	-	-	-	111	1.2	157	1.7	1	0.0	12	0.1	-	-
1973	-	-	-	-	-	-	-	-	1	0.0	2	0.0	101	1.1	138	1.5	3	0.0	12	0.1	-	-
1974	-	-	1	0.0	-	-	-	-	2	0.0	-	-	109	1.2	142	1.6	3	0.0	11	0.1	-	-
1975	-	-	-	-	-	-	-	-	1	0.0	1	0.0	81	0.9	110	1.2	5	0.1	10	0.1	1	0.0
1976	-	-	-	-	-	-	-	-	-	-	-	-	80	0.9	102	1.1	6	0.1	11	0.1	-	-
1977	-	-	1	0.0	-	-	-	-	-	-	-	-	67	0.7	97	1.1	6	0.1	3	0.0	-	-
1978	-	-	-	-	-	-	-	-	1	0.0	1	0.0	60	0.7	80	0.9	2	0.0	5	0.1	-	-
1979	-	-	-	-	-	-	-	-	-	-	-	-	47	0.5	62	0.7	2	0.0	9	0.1	-	-
1980	-	-	-	-	-	-	-	-	-	-	-	-	51	0.6	61	0.7	-	-	1	0.0	1	0.0
1981	-	-	-	-	-	-	1	0.0	-	-	-	-	41	0.4	53	0.6	-	-	4	0.0	1	0.0

[1] -From 1901 through 1920, syphilis includes all other venereal diseases, beginning with 1968 excludes aortic aneurysms not specified as syphilitic.

[2] -Effective January 1975, a new diagnostic classification system for tuberculosis was adopted. As a result, deaths and ates prior to 1975 are not directly comparable to the figures in 1975 and later years.

TABLE 4.8

NUMBER OF DEATHS AND DEATH RATES BY SPECIFIED CAUSES
MICHIGAN RESIDENTS, 1900-1981
(Rates per 100,000 population)

Year	Heart Disease		Cancer (all forms)[1]		Cerebrovascular Disease[2]		Accidents (all forms)[3]		Motor Vehicle Accidents[4]		Diabetes		Pneumonia		Chronic Liver Disease and Cirrhosis[5]		Athero-sclerosis[6]	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1900	2,836	117.1	1,460	60.3	2,136	88.2	1,740	71.9			224	9.3	2,388	98.6				
1901	3,040	123.6	1,484	60.3	2,147	87.3	1,901	77.3			264	10.7	2,901	117.9				
1902	3,302	132.1	1,483	59.3	2,097	83.9	1,796	71.9			289	11.6	2,637	105.5				
1903	3,702	145.9	1,694	56.8	2,321	91.5	2,017	79.5			265	10.4	2,607	102.7				
1904	3,981	154.5	1,728	67.1	2,431	94.3	2,035	79.0			298	11.6	2,646	102.7				
1905	3,715	142.0	1,693	64.7	2,405	91.9	2,034	77.8			267	10.2	2,417	92.4				
1906	3,933	148.2	1,736	65.4	2,554	96.2	2,126	80.1			311	11.7	2,621	98.7				
1907	4,269	158.5	1,747	64.9	2,690	99.9	2,209	82.0			352	13.1	3,018	112.0				
1908	4,202	153.8	1,921	70.3	2,630	96.3	2,036	74.5			359	13.1	2,313	84.7				
1909	4,354	157.1	1,948	70.3	2,739	98.8	1,903	68.7			374	13.5	2,265	81.7				
1910	4,581	163.0	2,105	74.9	3,091	110.0	2,158	76.8	49	1.7	398	14.2	2,785	99.1	282	10.0		
1911	4,639	160.2	2,142	74.0	2,916	100.7	2,121	73.2	44	1.5	373	12.9	2,763	95.4				
1912	5,324	178.5	2,291	76.8	2,707	90.8	2,005	67.2	75	2.5	448	15.0	2,796	93.8				
1913	4,908	160.0	2,388	77.8	2,834	92.4	2,333	76.1	132	4.3	483	15.7	3,082	100.5				
1914	5,124	162.5	2,414	76.6	2,993	94.9	2,108	66.8	120	3.8	503	16.0	2,909	92.2				
1915	5,538	171.0	2,567	79.2	3,384	104.5	2,219	68.5	190	5.9	498	15.4	3,229	99.7				
1916	5,819	175.0	2,710	81.5	3,559	107.0	2,853	85.8	257	7.7	500	15.0	3,698	111.2				
1917	6,103	178.9	2,765	81.1	3,703	108.6	2,925	85.8	335	9.8	569	16.7	4,455	130.6				
1918	6,091	174.2	2,931	83.8	3,493	99.9	2,599	74.3	279	8.0	591	16.9	7,238	207.0				
1919	5,651	157.7	2,990	83.5	3,483	97.2	2,612	72.9	328	9.2	559	15.6	4,081	113.9				
1920	6,732	183.5	3,158	86.1	3,876	105.7	2,646	72.1	397	10.8	577	15.7	5,794	157.9				
1921	6,176	163.1	3,373	89.1	3,931	103.8	2,476	65.4	403	10.6	586	15.5	2,849	75.3	261	6.9		
1922	6,897	176.7	3,481	89.2	4,041	103.5	2,475	63.4	529	13.6	650	16.7	3,728	95.5	267	6.8		
1923	7,266	180.7	3,545	88.2	4,420	109.9	2,826	70.3	677	16.8	635	15.8	4,719	117.4	251	6.2		
1924	6,985	168.8	3,824	92.4	4,241	102.5	3,090	74.7	1,001	24.2	661	16.0	3,332	80.5	256	6.2		
1925	7,540	177.2	3,858	90.7	4,623	108.6	3,278	77.0	1,103	25.9	746	17.5	3,294	77.4	319	7.5		
1926	8,281	189.4	4,087	93.5	4,663	106.6	3,557	81.3	1,221	27.9	743	17.0	4,440	101.5	326	7.5		
1927	8,780	195.5	4,264	95.0	4,378	97.5	3,634	80.9	1,389	30.9	819	18.2	3,543	78.9	340	7.6		
1928	9,786	212.4	4,381	95.1	4,718	102.4	3,704	80.4	1,429	31.0	905	19.6	4,518	98.1	373	8.1		
1929	10,185	215.6	4,571	96.7	4,694	99.3	3,913	82.8	1,552	32.8	935	19.8	4,216	89.2	361	7.6		
1930	9,947	205.4	4,572	94.4	4,533	93.6	3,805	78.6	1,572	32.5	880	18.2	3,321	68.6	329	6.8	1,047	21.6
1931	10,206	209.0	4,763	97.5	4,388	89.8	3,630	74.3	1,516	31.0	950	19.5	2,883	59.0	365	7.5	1,005	20.6
1932	11,162	226.6	4,935	100.2	4,518	91.7	3,179	64.5	1,229	25.0	1,121	22.8	3,238	65.7	386	7.8	948	19.2
1933	11,509	231.7	5,055	101.8	4,318	86.9	3,304	66.5	1,278	25.7	1,103	22.2	2,756	55.5	354	7.1	966	19.5
1934	11,824	236.1	5,370	107.2	4,485	89.6	3,774	75.4	1,511	30.2	1,100	22.0	3,466	69.2	378	7.5	914	18.3
1935	12,456	246.7	5,399	106.9	4,420	87.5	3,771	74.7	1,676	33.2	1,228	24.3	3,801	75.3	368	7.3	897	17.8
1936	13,374	262.7	5,752	113.0	4,705	92.4	5,246	103.1	1,924	37.8	1,266	24.9	4,096	80.5	446	8.8	997	19.6
1937	13,233	257.8	5,732	111.7	4,378	85.3	4,580	89.2	2,187	42.6	1,255	24.5	4,098	79.8	430	8.4	1,168	22.8
1938	13,887	268.4	6,059	117.1	4,543	87.8	3,608	69.7	1,490	28.8	1,283	24.8	2,869	55.5	424	8.2	869	16.8
1939	14,898	285.7	6,296	120.7	4,415	84.7	3,761	72.1	1,553	29.8	1,360	26.1	2,803	53.8	387	7.4	918	17.6
1940	15,480	294.5	6,513	123.9	4,690	89.2	3,961	75.4	1,743	33.2	1,408	26.8	2,478	47.1	468	8.9	941	17.9
1941	15,761	289.8	6,551	120.5	4,698	86.4	4,450	81.8	2,156	39.6	1,382	25.4	2,235	41.1	450	8.3	906	16.7
1942	16,016	289.2	6,646	120.0	4,841	87.4	3,685	66.5	1,368	24.7	1,448	26.1	2,349	42.4	535	9.7	1,015	18.3

Table 4.8 (continued)

Year	Heart Disease		Cancer (all forms)[1]		Cerebrovascular Disease[2]		Accidents (all forms)[3]		Motor Vehicle Accidents[4]		Diabetes		Pneumonia		Chronic Liver Disease and Cirrhosis[5]		Athero-sclerosis[6]	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1943	17,816	331.3	7,127	132.5	5,311	98.8	3,480	64.7	1,025	19.1	1,535	28.5	2,931	54.5	518	9.6	1,092	20.3
1944	17,004	316.2	7,277	135.3	4,954	92.1	3,350	62.3	1,103	20.5	1,554	28.9	2,369	44.1	471	8.8	980	18.2
1945	17,421	320.5	7,486	137.7	5,295	97.4	3,432	63.1	1,199	22.1	1,561	28.7	1,932	35.5	535	9.8	970	17.8
1946	17,691	309.9	7,845	137.4	5,224	91.5	3,776	66.1	1,506	26.4	1,530	26.8	1,891	33.1	554	9.7	933	16.3
1947	18,412	303.4	8,188	134.9	5,426	89.4	3,848	63.4	1,499	24.7	1,618	26.7	2,089	34.4	697	11.5	1,031	17.0
1948	18,726	302.3	8,336	134.6	5,272	85.1	4,017	64.8	1,545	24.9	1,771	28.6	1,853	29.9	771	12.4	1,085	17.5
1949	19,137	301.3	8,697	136.9	5,438	85.6	3,838	60.4	1,493	23.5	1,884	29.7	1,885	29.7	730	11.5	1,135	17.9
1950	20,521	322.1	8,685	136.3	6,376	100.1	3,783	59.4	1,680	26.4	1,438	22.6	1,358	21.3	616	9.7	1,296	20.3
1951	21,118	322.6	9,187	140.4	6,579	100.5	3,916	59.8	1,806	27.6	1,374	21.0	1,619	24.7	569	8.7	1,312	20.0
1952	21,247	316.8	9,256	138.0	6,521	97.2	3,901	58.2	1,815	27.1	1,339	20.0	1,571	23.4	599	8.9	1,294	19.3
1953	22,425	327.3	9,904	144.5	7,045	102.8	4,375	63.8	2,051	29.9	1,419	20.7	1,538	22.4	715	10.4	1,270	18.5
1954	22,362	318.4	10.105	143.9	6,964	99.1	3,948	56.2	1,916	27.3	1,469	20.9	1,380	19.6	677	9.6	1,170	16.7
1955	23,440	323.9	10,297	142.3	7,362	101.7	4,213	58.2	2,129	29.4	1,415	19.6	1,538	21.3	805	11.1	1,237	17.1
1956	24,661	328.1	10,489	139.6	7,114	94.7	3,925	52.2	1,826	24.3	1,443	19.2	1,723	22.9	788	10.5	1,251	16.6
1957	25,369	325.1	10,810	138.5	7,632	97.8	3,643	46.7	1,680	21.5	1,510	19.4	2,045	26.2	861	11.0	1,248	16.0
1958	25,215	320.6	10,946	139.2	7,547	95.9	3,306	42.0	1,466	18.6	1,595	20.3	2,076	26.4	818	10.4	1,300	16.5
1959	25,323	318.1	11,113	139.6	7,700	96.7	3,666	45.1	1,587	19.9	1,715	21.5	1,810	22.7	815	10.2	1,403	17.6
1960	25,7[illegible]3	328.9	11,331	144.8	7,682	98.2	3,688	47.1	1,710	21.9	1,784	22.8	2,002	25.6	840	10.7	1,352	17.3
1961	25,519	322.9	11,476	145.2	7,745	98.0	3,692	46.7	1,656	21.0	1,778	22.5	1,692	21.4	858	10.9	1,448	18.3
1962	27,226	342.9	11,752	148.0	7,783	98.0	3,758	47.3	1,668	21.0	1,908	24.0	1,824	23.0	859	10.8	1,477	18.6
1963	27,483	342.3	12,078	150.4	8,168	101.7	4,033	50.2	2,005	25.0	2,049	25.5	1,995	24.8	958	11.9	1,652	20.6
1964	27,496	339.5	12,087	149.2	7,940	98.0	4,416	54.5	2,286	28.2	2,055	25.4	1,714	21.2	995	12.3	1,559	19.2
1965	28,134	343.1	12,419	151.5	7,769	94.8	4,494	54.8	2,271	27.7	2,153	26.3	1,987	24.2	1,068	13.0	1,726	21.1
1966	28,277	340.1	12,506	150.4	7,732	93.0	4,737	57.0	2,407	29.0	2,243	27.0	2,026	24.4	1,152	13.9	1,745	21.0
1967	28,757	333.8	13,030	151.2	7,846	91.1	4,519	52.4	2,265	26.3	2,182	25.3	1,973	22.9	1,240	14.4	1,730	20.1
1968	29,680	342.1	13,292	153.2	7,913	91.2	4,603	53.1	2,466	28.4	2,298	26.5	2,341	27.0	1,259	14.5	1,262	14.5
1969	29,396	336.6	13,328	152.6	7,706	88.2	4,766	54.6	2,579	29.5	2,188	25.1	2,229	25.5	1,430	16.4	1,289	14.8
1970	29,204	329.1	13,551	152.7	7,691	86.7	4,428	49.9	2,309	26.0	2,180	24.6	2,004	22.6	1,558	17.6	1,174	13.2
1971	30,095	335.4	13,594	151.5	7,826	87.2	4,426	49.3	2,274	25.3	2,103	23.4	1,981	22.1	1,657	18.5	1,187	13.2
1972	30,865	342.0	14,045	155.6	7,999	88.6	4,566	50.6	2,450	27.1	2,222	24.6	2,009	22.3	1,778	19.7	1,153	12.8
1973	29,944	330.1	14,220	156.7	7,987	88.0	4,630	51.0	2,389	26.3	2,074	22.9	1,958	21.6	1,711	18.9	1,142	12.6
1974	29,220	320.8	14,241	156.3	7,645	83.9	4,211	46.2	1,929	21.2	1,940	21.3	1,637	18.0	1,650	18.1	1,187	13.0
1975	28,298	310.7	14,445	158.6	7,262	79.7	4,002	43.9	1,841	20.2	1,819	20.0	1,690	18.6	1,574	17.3	1,119	12.3
1976	29,233	320.6	14,880	163.2	7,354	80.7	3,912	42.9	1,993	21.9	1,719	18.9	1,812	19.9	1,486	16.3	1,207	13.2
1977	28,895	315.6	15,125	165.2	6,818	74.5	3,945	43.1	1,993	21.8	1,615	17.6	1,639	17.9	1,356	14.8	1,164	12.7
1978	29,406	319.6	15,249	165.7	6,520	70.9	3,970	43.1	2,138	23.2	1,551	16.9	1,828	19.9	1,351	14.7	1,146	12.5
1979	29,296	316.7	15,409	166.6	6,067	65.6	3,839	41.5	1,967	21.3	1,449	15.7	1,454	15.7	1,367	14.8	1,173	12.7
1980	29,790	321.6	15,828	170.9	6,164	66.6	3,627	39.2	1,880	20.3	1,467	15.8	1,712	18.5	1,362	14.7	1,254	13.5
1981	30,172	325.5	16,142	174.1	6,121	66.0	3,390	36.6	1,727	18.6	1,487	16.0	1,644	17.7	1,253	13.5	1,270	13.7

[1] -Cancer includes leukemias, aleukemias, and Hodgkin's disease beginning with 1921.

[2] -Cerebrovascular disease was called Vascular Lesions Affecting-Central Nervous System prior to 1968.

[3] -Accidents exclude injuries undetermined whether accidentally or purposely inflicted since 1968.

[4] -Motor vehicle accidents do not include collision with heavier vehicles from 1910 through 1922. Motorcycle accidents are included beginning 1923.

[5] -Chronic liver disease and cirrhosis was called cirrhosis of the liver prior to 1979.

[6] -[illegible]erosclerosis was called General Arteriosclerosis prior [illegible] 1968 and was called Arteriosclerosis from 1968-1978.

TABLE 4.9
SELECTED VITAL STATISTICS BY COUNTY, MICHIGAN RESIDENTS, 1981

Area	Population Estimate	Live Births	Low Weight Live Births	Deaths	Infant Deaths	Neonatal Deaths	Peri-natal Deaths	Fetal Deaths	Marriages[1]	Divorces[1]
STATE	9270000	140579	9752	75818	1851	1281	2194	1083	85252	43167
Alcona	9903	100	4	118	-	-	-	-	88	38
Alger	9105	161	8	110	-	-	-	-	75	85
Allegan	82600	1389	78	598	18	10	19	10	733	355
Alpena	32649	516	39	274	7	4	10	6	340	169
Antrim	16604	227	10	181	-	-	-	-	159	66
Arenac	14928	227	20	179	7	6	4	-	129	29
Baraga	8616	119	2	106	-	-	-	-	55	31
Barry	46853	701	38	333	13	10	11	3	382	182
Bay	119457	1804	96	928	12	7	17	10	1132	539
Benzie	11445	175	8	113	3	1	2	1	124	47
Berrien	170167	2641	212	1483	38	24	43	24	1708	876
Branch	40216	658	34	361	7	2	2	-	462	230
Calhoun	141363	2163	136	1248	29	18	30	14	1384	875
Cass	49267	727	41	404	4	2	8	6	425	245
Charlevoix	19883	352	21	190	5	4	4	-	238	118
Cheboygan	20847	346	22	215	9	7	8	2	205	105
Chippewa	29317	401	27	276	3	3	6	3	268	121
Clare	24377	363	25	273	6	4	4	-	263	98
Clinton	55950	896	44	307	6	4	10	6	398	221
Crawford	9617	195	14	94	4	4	7	3	130	59
Delta	39247	582	27	363	4	3	6	3	401	165
Dickinson	25380	382	13	305	3	2	4	2	293	125
Eaton	88389	1313	81	500	9	5	14	11	723	464
Emmet	23703	351	20	222	7	6	7	4	281	130
Genesee	450861	7478	611	3246	116	80	140	73	4519	2404
Gladwin	20321	277	10	198	3	3	3	1	169	92
Gogebic	19813	235	15	287	2	2	3	1	202	59
Gd. Traverse	56736	952	38	465	14	10	14	5	747	391
Gratiot	40708	619	32	369	5	3	3	1	410	152
Hillsdale	41650	634	46	417	3	3	6	4	404	207
Houghton	38059	515	19	392	3	2	2	-	282	100
Huron	36680	539	31	408	5	3	8	5	309	111
Ingham	277956	4420	246	1649	52	32	71	41	2987	1327
Ionia	52362	915	59	415	14	7	11	5	516	237
Iosco	29106	564	31	289	7	4	5	1	344	147
Iron	13721	185	6	205	-	-	-	-	131	46
Isabella	54084	719	29	298	11	6	5	1	452	184
Jackson	149799	2213	134	1225	24	15	35	23	1490	730
Kalamazoo	215876	3258	199	1471	42	28	44	19	2194	1252
Kalkaska	11296	207	10	109	5	4	7	3	115	61
Kent	451572	8503	546	3444	104	75	127	65	5071	2404

TABLE 4.9 (continued)

Area	Population Estimate	Live Births	Low Weight Live Births	Deaths	Infant Deaths	Neonatal Deaths	Peri-natal Deaths	Fetal Deaths	Marriages[1]	Divorces[1]
Keweenaw	1969	23	2	31	1	1	1	-	9	6
Lake	7821	127	13	112	1	-	-	-	71	35
Lapeer	70299	1101	63	478	12	10	21	11	593	342
Leelanau	13783	199	7	120	2	1	2	2	94	53
Lenawee	90132	1378	82	727	15	11	20	10	771	486
Livingston	101196	1437	72	566	11	6	24	19	788	452
Luce	6453	91	6	67	-	-	-	-	70	24
Mackinac	10262	158	10	115	3	2	3	1	137	24
Macomb	693698	9406	569	4912	112	84	127	55	6522	3333
Manistee	22807	292	14	248	5	4	3	1	189	87
Marquette	74140	1302	60	466	12	7	16	9	694	332
Mason	26872	416	31	296	4	3	7	4	221	125
Mecosta	37783	419	23	209	4	3	6	4	264	134
Menominee	26071	399	19	293	5	2	3	1	290	97
Midland	73373	1197	61	481	15	6	10	4	751	388
Missaukee	10198	213	9	93	2	1	2	1	105	41
Monroe	133367	1937	120	906	24	19	28	9	1195	611
Montcalm	49387	763	44	462	13	8	15	8	560	258
Montmorency	7597	96	12	100	1	-	-	-	65	34
Muskegon	157913	2542	198	1434	40	27	56	34	1614	917
Newaygo	35601	539	23	311	4	1	7	6	333	152
Oakland	1013274	13917	836	7239	158	110	186	85	9843	5883
Oceana	22142	378	25	180	6	4	7	3	220	92
Ogemaw	16386	282	11	189	7	5	6	2	183	71
Ontonagon	10086	131	4	105	1	1	1	-	85	37
Osceola	19191	346	22	164	4	2	3	2	195	20
Oscoda	7125	103	4	85	1	1	1	1	80	9
Otsego	15072	272	20	130	3	3	6	4	178	74
Ottawa	159735	2740	116	928	23	18	26	13	1398	445
Presque Isle	14111	222	15	169	3	3	5	3	114	50
Roscommon	17339	240	20	227	4	2	2	1	148	86
Saginaw	227384	3636	297	1673	64	50	81	40	1984	720
St. Clair	139292	2005	143	1222	22	14	35	23	1303	721
St. Joseph	57922	912	63	511	10	7	18	13	611	250
Sanilac	40964	625	25	393	6	4	6	2	367	160
Schoolcraft	8339	127	5	103	-	-	2	2	79	29
Shiawassee	70997	1063	49	492	3	2	7	5	631	366
Tuscola	56937	871	45	448	11	6	13	8	490	235
Van Buren	67408	1180	77	595	10	4	9	7	638	434
Washtenaw	266996	3887	235	1391	46	36	55	25	2749	1452
Wayne	2312415	34120	3193	22795	572	403	662	303	17609	8666
Wexford	25697	434	25	265	1	1	2	2	273	159
Co. Not Stated	-	11	2	19	6	6	10	4	-	-

[1] By county of occurrence rather than county of residenc

TABLE 4.10
SELECTED VITAL STATISTICS RATES BY COUNTY, MICHIGAN RESIDENTS, 1981

Area	Live Births	Low Weight Live Births[1]	Deaths	Infant Deaths	Neonatal Deaths	Peri-natal Deaths	Fetal Deaths	Marriages[2]	Divorces[2]
*STATE	15.2	69.4	8.2	13.2	9.1	15.5	7.6	18.4	9.3
Alcona	10.1	40.0	11.9	-	-	-	-	17.8	7.7
Alger	17.7	49.7	12.1	-	-	-	-	16.5	18.7
Allegan	16.8	56.2	7.2	13.0	7.2	13.6	7.1	17.7	8.6
Alpena	15.8	75.6	8.4	13.6	7.8	19.2	11.5	20.8	10.4
Antrim	13.7	44.1	10.9	-	-	-	-	19.2	7.9
Arenac	15.2	88.1	12.0	30.8	26.4	17.6	-	17.3	3.9
Baraga	13.8	16.8	12.3	-	-	-	-	12.8	7.2
Barry	15.0	54.2	7.1	18.5	14.3	15.6	4.3	16.3	7.8
Bay	15.1	53.2	7.8	6.7	3.9	9.4	5.5	19.0	9.0
Benzie	15.3	45.7	9.9	17.1	5.7	11.4	5.7	21.7	8.2
Berrien	15.5	80.3	6.7	14.4	9.1	16.1	9.0	20.1	10.3
Branch	16.4	51.7	9.0	10.6	3.0	3.0	-	23.0	11.4
Calhoun	15.3	62.9	8.8	13.4	8.3	13.8	6.4	19.6	12.4
Cass	14.8	56.4	8.2	5.5	2.8	10.9	8.2	17.3	9.9
Charlevoix	17.7	59.7	9.6	14.2	11.4	11.4	-	23.9	11.9
Cheboygan	16.6	63.6	10.3	26.0	20.2	23.0	5.7	19.7	10.1
Chippewa	13.7	67.3	9.4	7.5	7.5	14.9	7.4	18.3	8.3
Clare	14.9	68.9	11.2	16.5	11.0	11.0	-	21.6	8.0
Clinton	16.0	49.1	5.5	6.7	4.5	11.1	6.7	14.2	7.9
Crawford	20.3	71.8	9.8	20.5	20.5	35.4	15.2	27.0	12.3
Delta	14.8	46.4	9.2	6.9	5.2	10.3	5.1	20.4	8.4
Dickinson	15.1	34.0	12.0	7.9	5.2	10.4	5.2	23.1	9.9
Eaton	14.9	61.7	5.7	6.9	3.8	10.6	8.3	16.4	10.5
Emmet	14.8	57.0	9.4	19.9	17.1	19.7	11.3	23.7	11.0
Genesee	16.6	81.7	7.2	15.5	10.7	18.5	9.7	20.0	10.7
Gladwin	13.6	36.1	9.7	10.8	10.8	10.8	3.6	16.6	9.1
Gogebic	11.9	63.8	14.5	8.5	8.5	12.7	4.2	20.4	6.0
Gd. Traverse	16.8	39.9	8.2	14.7	10.5	14.6	5.2	26.3	13.8
Gratiot	15.2	51.7	9.1	8.1	4.8	4.8	1.6	20.1	7.5
Hillsdale	15.2	72.6	10.0	4.7	4.7	9.4	6.3	19.4	9.9
Houghton	13.5	36.9	10.3	5.8	3.9	3.9	-	14.8	5.3
Huron	14.7	57.5	11.1	9.3	5.6	14.7	9.2	16.8	6.1
Ingham	15.9	55.7	5.9	11.8	7.2	15.9	9.2	21.5	9.5
Ionia	17.5	64.5	7.9	15.3	7.7	12.0	5.4	19.7	9.1
Iosco	19.4	55.0	9.9	12.4	7.1	8.8	1.8	23.6	10.1
Iron	13.5	32.4	14.9	-	-	-	-	19.1	6.7
Isabella	13.3	40.3	5.5	15.3	8.3	6.9	1.4	16.7	6.8
Jackson	14.8	60.6	8.2	10.8	6.8	15.7	10.3	19.9	9.7
Kalamazoo	15.1	61.1	6.8	12.9	8.6	13.4	5.8	20.3	11.6
Kalkaska	18.3	48.3	9.6	24.2	19.3	33.3	14.3	20.4	10.8
Kent	18.8	64.2	7.6	12.2	8.8	14.8	7.6	22.5	10.6
Keweenaw	11.7	87.0	15.7	43.5	43.5	43.5	-	9.1	6.1

TABLE 4.10 (continued)

Area	Live Births	Low Weight Live Births[1]	Deaths	Infant Deaths	Neonatal Deaths	Peri-natal Deaths	Fetal Deaths	Marriages[2]	Divorces[2]
Lake	16.2	102.4	14.3	7.9	-	-	-	18.2	9.0
Lapeer	15.7	57.2	6.8	10.9	9.1	18.9	9.9	16.9	9.7
Leelanau	14.4	35.2	8.7	10.1	5.0	10.0	10.0	13.6	7.7
Lenawee	15.3	59.5	8.1	10.9	8.0	14.4	7.2	17.1	10.8
Livingston	14.2	50.1	5.6	7.7	4.2	16.5	13.0	15.6	8.9
Luce	14.1	65.9	10.4	-	-	-	-	21.7	7.4
Mackinac	15.4	63.3	11.2	19.0	12.7	18.9	6.3	26.7	4.7
Macomb	13.6	60.5	7.1	11.9	8.9	13.4	5.8	18.8	9.6
Manistee	12.8	47.9	10.9	17.1	13.7	10.2	3.4	16.6	7.6
Marquette	17.6	46.1	6.3	9.2	5.4	12.2	6.9	18.7	9.0
Mason	15.5	74.5	11.0	9.6	7.2	16.7	9.5	16.4	9.3
Mecosta	11.1	54.9	5.5	9.5	7.2	14.2	9.5	14.0	7.1
Menominee	15.3	47.6	11.2	12.5	5.0	7.5	2.5	22.2	7.4
Midland	16.3	51.0	6.6	12.5	5.0	8.3	3.3	20.5	10.6
Missaukee	20.9	42.3	9.1	9.4	4.7	9.3	4.7	20.6	8.0
Monroe	14.5	62.0	6.8	12.4	9.8	14.4	4.6	17.9	9.2
Montcalm	15.9	56.2	9.4	16.6	10.2	19.0	10.1	22.7	10.4
Montmorency	12.6	125.0	13.2	10.4	-	-	-	17.1	9.0
Muskegon	16.1	77.9	9.1	15.7	10.6	21.7	13.2	20.4	11.6
Newaygo	15.1	42.7	8.7	7.4	1.9	12.8	11.0	18.7	8.5
Oakland	13.7	60.1	7.1	11.4	7.9	13.3	6.1	19.4	11.6
Oceana	17.1	66.1	8.1	15.9	10.6	18.4	7.9	19.9	8.3
Ogemaw	17.2	39.0	11.5	24.8	17.7	21.1	7.0	22.3	8.7
Ontonagon	13.0	30.5	10.4	7.6	7.6	7.6	-	16.9	7.3
Osceola	18.0	63.6	8.5	11.6	5.8	8.6	5.7	20.3	2.1
Oscoda	14.5	38.8	11.9	9.7	9.7	9.6	9.6	22.5	2.5
Otsego	18.0	73.5	8.6	11.0	11.0	21.7	14.5	23.6	9.8
Ottawa	17.2	42.3	5.8	8.4	6.6	9.4	4.7	17.5	5.6
Presque Isle	15.7	67.6	12.0	13.5	13.5	22.2	13.3	16.2	7.1
Roscommon	13.8	83.3	13.1	16.7	8.3	8.3	4.1	17.1	9.9
Saginaw	16.0	81.7	7.4	17.6	13.8	22.0	10.9	17.5	6.3
St. Clair	14.4	71.3	8.8	11.0	7.0	17.3	11.3	18.7	10.4
St. Joseph	15.7	69.1	8.8	11.0	7.7	19.5	14.1	21.1	8.6
Sanilac	15.3	40.0	9.6	9.6	6.4	9.6	3.2	17.9	7.8
Schoolcraft	15.2	39.4	12.4	-	-	15.5	15.5	18.9	7.0
Shiawassee	15.0	46.1	6.9	2.8	1.9	6.6	4.7	17.8	10.3
Tuscola	15.3	51.7	7.9	12.6	6.9	14.8	9.1	17.2	8.3
Van Buren	17.5	65.3	8.8	8.5	3.4	7.6	5.9	18.9	12.9
Washtenaw	14.6	60.5	5.2	11.8	9.3	14.1	6.4	20.6	10.9
Wayne	14.8	93.6	9.9	16.8	11.8	19.2	8.8	15.2	7.5
Wexford	16.9	57.6	10.3	2.3	2.3	4.6	4.6	21.2	12.4

[1] Ratio per 1,000 live births.

[2] By county of occurrence rather than county of residence. Rate of persons per population rather than events per population.

Table 4.11
Live Births with Selected Risk Factors by County of Residence, Michigan Residents, 1981

STATE AND COUNTIES	COMPLICATIONS REPORTED		CONGENITAL ANOMALIES REPORTED		4TH BIRTH OR HIGHER		MOTHER'S EDUCATION 11TH GRADE OR LESS		INADEQUATE PRENATAL CARE[1]		MOTHERS UNDER 18 YEARS OF AGE	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
STATE	37,096	26.4	1,135	0.8	12,935	9.2	28,670	20.4	9,499	6.8	6,642	4.7
Alcona	20	20.0	1	1.0	12	12.0	25	25.0	5	5.0	11	11.0
Alger	33	20.5	1	0.6	22	13.7	27	16.8	22	13.7	10	6.2
Allegan	294	21.2	16	1.2	130	9.4	282	20.3	70	5.0	59	4.2
Alpena	99	19.2	6	1.2	45	8.7	94	18.2	39	7.6	18	3.5
Antrim	35	15.4	1	0.4	11	4.8	47	20.7	22	9.7	15	6.6
Arenac	42	18.5	3	1.3	32	14.1	57	25.1	17	7.5	9	4.0
Baraga	38	31.9	2	1.7	13	10.9	15	12.6	7	5.9	4	3.4
Barry	361	51.5	19	2.7	52	7.4	141	20.1	45	6.4	31	4.4
Bay	399	22.1	13	0.7	161	8.9	350	19.4	86	4.8	73	4.0
Benzie	31	17.7	3	1.7	14	8.0	39	22.3	14	8.0	8	4.6
Berrien	819	31.0	31	1.2	257	9.7	771	29.2	278	10.5	222	8.4
Branch	140	21.3	6	0.9	40	6.1	161	24.5	74	11.2	33	5.0
Calhoun	668	30.9	16	0.7	163	7.5	552	25.5	176	8.1	141	6.5
Cass	237	32.6	6	0.8	75	10.3	211	29.0	65	8.9	47	6.5
Charlevoix	103	29.3	-	-	38	10.8	55	15.6	20	5.7	9	2.6
Cheboygan	117	33.8	7	2.0	33	9.5	61	17.6	26	7.5	14	4.0
Chippewa	51	12.7	-	-	42	10.5	82	20.4	40	10.0	20	5.0
Clare	99	27.3	6	1.7	45	12.4	86	23.7	56	15.4	23	6.3
Clinton	216	24.1	10	1.1	87	9.7	104	11.6	26	2.9	32	3.6
Crawford	64	32.8	-	-	17	8.7	42	21.5	18	9.2	11	5.6
Delta	106	18.2	7	1.2	60	10.3	75	12.9	31	5.3	27	4.6
Dickinson	88	23.0	3	0.8	33	8.6	46	12.0	14	3.7	8	2.1
Eaton	341	26.0	10	0.8	95	7.2	173	13.2	52	4.0	45	3.4
Emmet	93	26.5	-	-	33	9.4	47	13.4	30	8.5	15	4.3
Genesee	2699	36.1	62	0.8	726	9.7	1776	23.7	423	5.7	446	6.0
Gladwin	83	30.0	3	1.1	29	10.5	68	24.5	19	6.9	11	4.0
Gogebic	59	25.1	2	0.9	31	13.2	28	11.9	17	7.2	6	2.6
Gd. Traverse	115	12.1	6	0.6	65	6.8	114	12.0	59	6.2	32	3.4
Gratiot	133	21.5	-	-	65	10.5	119	19.2	40	6.5	27	4.4
Hillsdale	261	41.2	4	0.6	66	10.4	150	23.7	64	10.1	25	3.9
Houghton	148	28.7	16	3.1	100	19.4	65	12.6	36	7.0	20	3.9
Huron	121	22.4	5	0.9	76	14.1	77	14.3	55	10.2	23	4.3
Ingham	850	19.2	21	0.5	372	8.4	817	18.5	220	5.0	195	4.4
Ionia	196	21.4	6	0.7	94	10.3	193	21.1	64	7.0	41	4.5
Iosco	149	26.4	6	1.1	34	6.0	99	17.6	41	7.3	29	5.1
Iron	68	36.8	5	2.7	16	8.6	28	15.1	11	5.9	10	5.4
Isabella	172	23.9	6	0.8	78	10.8	125	17.4	114	15.9	28	3.9
Jackson	489	22.1	10	0.5	191	8.6	455	20.6	168	7.6	118	5.3
Kalamazoo	1110	34.1	20	0.6	218	6.7	551	16.9	168	5.2	141	4.3
Kalkaska	20	9.7	1	0.5	17	8.2	42	20.3	20	9.7	8	3.9
Kent	1329	15.6	42	0.5	661	7.8	1448	17.0	338	4.0	374	4.4

Table 4.11 (continued)

STATE AND COUNTIES	COMPLICATIONS REPORTED		CONGENITAL ANOMALIES REPORTED		4TH BIRTH OR HIGHER		MOTHER'S EDUCATION 11TH GRADE OR LESS		INADEQUATE PRENATAL CARE[1]		MOTHERS UNDER 18 YEARS OF AGE	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Keweenaw	7	30.4	-	-	4	17.4	1	4.3	2	8.7	-	-
Lake	22	17.3	3	2.4	18	14.2	42	33.1	17	13.4	13	10.2
Lapeer	250	22.7	10	0.9	100	9.1	205	18.6	53	4.8	38	3.5
Leelanau	37	18.6	6	3.0	18	9.0	18	9.0	6	3.0	-	-
Lenawee	414	30.0	11	0.8	132	9.6	282	20.5	155	11.2	59	4.3
Livingston	365	25.4	12	0.8	139	9.7	195	13.6	86	6.0	32	2.2
Luce	19	20.9	-	-	8	8.8	35	38.5	7	7.7	3	3.3
Mackinac	46	29.1	3	1.9	14	8.9	25	15.8	14	8.9	3	1.9
Macomb	2655	28.2	58	0.6	678	7.2	1404	14.9	342	3.6	241	2.6
Manistee	49	16.8	2	0.7	29	9.9	42	14.4	26	8.9	12	4.1
Marquette	576	44.2	21	1.6	114	8.8	144	11.1	77	5.9	31	2.4
Mason	82	19.7	4	1.0	34	8.2	87	20.9	30	7.2	12	2.9
Mecosta	127	30.3	8	1.9	43	10.3	78	18.6	28	6.7	16	3.8
Menominee	123	30.8	2	0.5	33	8.3	54	13.5	26	6.5	10	2.5
Midland	413	34.5	16	1.3	86	7.2	163	13.6	38	3.2	31	2.6
Missaukee	28	13.1	-	-	22	10.3	41	19.2	10	4.7	7	3.3
Monroe	555	28.7	8	0.4	155	8.0	423	21.8	282	14.6	97	5.0
Montcalm	179	22.9	6	0.8	61	7.8	187	23.9	82	10.5	34	4.3
Montmorency	16	16.7	-	-	9	9.4	18	18.8	15	15.6	4	4.2
Muskegon	447	17.6	17	0.7	261	10.3	576	22.7	159	6.3	159	6.3
Newaygo	119	22.1	9	1.7	57	10.6	148	27.5	85	15.8	30	5.6
Oakland	3259	23.4	97	0.7	1026	7.4	1924	13.8	491	3.5	357	2.6
Oceana	95	25.1	7	1.9	41	10.8	101	26.7	39	10.3	23	6.1
Ogemaw	73	25.9	3	1.1	28	9.9	73	25.9	19	6.7	11	3.9
Ontonagon	35	26.7	-	-	21	16.0	32	24.4	26	19.8	12	9.2
Osceola	75	21.7	3	0.9	33	9.5	63	18.2	24	6.9	15	4.3
Oscoda	24	23.3	2	1.9	14	13.6	32	31.1	15	14.6	6	5.8
Otsego	59	21.7	5	1.8	34	12.5	37	13.6	14	5.1	8	2.9
Ottawa	421	15.4	19	0.7	221	8.1	368	13.4	80	2.9	84	3.1
Presque Isle	49	22.1	4	1.8	35	15.8	26	11.7	15	6.8	7	3.2
Roscommon	64	26.7	2	0.8	12	5.0	63	26.3	16	6.7	9	3.8
Saginaw	639	17.6	22	0.6	390	10.7	840	23.1	258	7.1	234	6.4
St. Clair	582	29.0	17	0.8	165	8.2	420	20.9	126	6.3	81	4.0
St. Joseph	227	24.9	7	0.8	104	11.4	255	28.0	67	7.3	46	5.0
Sanilac	222	35.5	8	1.3	63	10.1	115	18.4	73	11.7	29	4.6
Schoolcraft	17	13.4	2	1.6	13	10.2	28	22.0	8	6.3	5	3.9
Shiawassee	264	24.8	9	0.8	99	9.3	199	18.7	66	6.2	38	3.6
Tuscola	268	30.8	7	0.8	88	10.1	184	21.1	52	6.0	34	3.9
Van Buren	364	30.8	8	0.7	110	9.3	350	29.7	114	9.7	67	5.7
Washtenaw	1201	30.9	11	0.3	302	7.8	480	12.3	160	4.1	111	2.9
Wayne	10081	29.5	322	0.9	3728	10.9	9091	26.6	3181	9.3	2193	6.4
Wexford	49	11.3	2	0.5	43	9.9	120	27.6	25	5.8	20	4.6
County Not Stated	3	27.3	-	-	1	9.1	3	27.3	-	-	1	9.1

[1] irths in which the mother received no care prior to the ird trimester, or had five or fewer prenatal visits.

Table 4.12
Live Births by Age of Mother, by County
Michigan Residents, 1981

AREA	TOTAL	AGE OF MOTHER												
		UNDER 15	15	16	17	18	19	*15-19*	20-24	25-29	30-34	35-39	40 AND OVER	AGE NOT STATED
Michigan	140,579	300	849	2,004	3,489	5,214	6,841	*18,397*	47,737	46,527	22,178	4,701	729	10
Alcona	100	-	1	3	7	3	7	*21*	36	29	11	3	-	-
Alger	161	1	2	1	6	5	8	*22*	46	61	24	7	-	-
Allegan	1,389	1	3	17	38	63	82	*203*	510	445	187	38	5	-
Alpena	516	-	1	6	11	21	31	*70*	199	154	80	10	3	-
Antrim	227	-	3	4	8	11	14	*40*	89	65	27	6	-	-
Arenac	227	-	3	4	2	12	18	*39*	84	77	20	7	-	-
Baraga	119	-	-	1	3	5	5	*14*	47	42	13	1	2	-
Barry	701	1	5	5	20	35	48	*113*	251	218	95	20	2	1
Bay	1,804	-	6	29	38	54	88	*215*	653	621	257	47	11	-
Benzie	175	2	1	5	-	6	7	*19*	61	62	25	6	-	-
Berrien	2,641	18	27	75	102	125	168	*497*	885	774	373	85	9	-
Branch	658	-	6	10	17	36	42	*111*	262	199	61	18	7	-
Calhoun	2,163	5	17	38	81	111	130	*377*	823	658	250	43	7	-
Cass	727	2	5	13	27	34	53	*132*	262	201	105	21	4	-
Charlevoix	352	1	1	3	4	11	16	*35*	129	119	57	10	1	-
Cheboygan	346	1	1	2	10	15	13	*41*	126	118	50	7	3	-
Chippewa	401	1	2	7	10	18	35	*72*	151	120	42	12	3	-
Clare	363	1	1	9	12	14	25	*61*	139	122	35	5	-	-
Clinton	896	1	3	11	17	29	52	*112*	278	311	157	35	2	-
Crawford	195	-	-	2	9	5	15	*31*	81	55	23	5	-	-
Delta	582	-	-	8	19	32	29	*88*	190	196	83	21	4	
Dickinson	382	-	-	4	4	20	19	*47*	146	128	53	6	2	-
Eaton	1,313	1	1	15	28	53	72	*169*	412	433	259	37	2	-
Emmet	351	-	1	6	8	6	12	*33*	115	111	72	16	4	-
Genesee	7,478	17	56	124	249	339	448	*1,216*	2,717	2,334	930	225	38	1
Gladwin	277	-	2	4	5	15	17	*43*	126	81	21	6	-	-
Gogebic	235	-	-	1	5	10	13	*29*	79	77	35	13	2	-
Gd. Traverse	952	1	2	8	21	26	33	*90*	301	358	168	30	4	-
Gratiot	619	-	1	11	15	22	42	*91*	243	192	73	18	2	-
Hillsdale	634	-	-	11	14	18	49	*92*	253	192	77	17	3	-
Houghton	515	-	2	8	10	11	21	*52*	191	160	77	27	8	-
Huron	539	-	1	4	18	12	28	*63*	195	171	81	22	7	-
Ingham	4,420	5	22	62	106	146	206	*542*	1,468	1,506	731	151	17	-
Ionia	915	-	2	15	24	42	62	*145*	345	288	106	27	4	-
Iosco	564	1	3	9	16	31	42	*101*	231	159	65	5	2	-
Iron	185	1	1	1	7	6	6	*21*	55	73	30	4	1	-
Isabella	719	-	3	11	14	23	36	*87*	288	219	99	23	3	-
Jackson	2,213	2	19	30	67	89	106	*311*	820	717	303	54	6	-
Kalamazoo	3,258	7	15	47	72	103	142	*379*	1,000	1,184	575	102	11	-
Kalkaska	207	-	-	1	7	11	15	*34*	89	56	24	2	2	-
Kent	8,503	21	57	98	198	281	385	*1,019*	2,994	2,915	1,313	205	34	2
Keweenaw	23	-	-	-	-	-	-	-	6	10	4	2	1	-

Table 4.12 (Continued)

AREA	TOTAL	AGE OF MOTHER												
		UNDER 15	15	16	17	18	19	*15-19*	20-24	25-29	30-34	35-39	40 AND OVER	AGE NOT STATED
Lake	127	-	5	3	5	6	10	*29*	48	35	11	4	-	-
Lapeer	1,101	1	1	11	25	37	52	*126*	424	350	164	28	8	-
Leelanau	199	-	-	-	-	2	4	*6*	62	83	34	12	2	-
Lenawee	1,378	1	5	21	32	51	77	*186*	504	445	180	55	7	-
Livingston	1,437	1	3	9	19	36	51	*118*	423	519	312	57	7	-
Luce	91	-	1	2	-	3	8	*14*	42	23	9	2	1	-
Mackinac	158	-	-	1	2	5	7	*15*	56	55	25	6	1	-
Macomb	9,406	6	21	64	150	230	323	*788*	2,932	3,583	1,702	343	52	-
Manistee	292	2	2	4	4	7	11	*28*	104	94	54	10	-	-
Marquette	1,302	1	3	6	21	48	58	*136*	483	447	188	37	9	1
Mason	416	-	1	4	7	19	32	*63*	157	126	52	15	3	-
Mecosta	419	-	1	3	12	15	26	*57*	178	117	57	10	-	-
Menominee	399	-	2	3	5	14	28	*52*	157	128	51	10	1	-
Midland	1,197	1	3	10	17	30	36	*96*	379	457	218	41	5	-
Missaukee	213	-	1	3	3	8	15	*30*	93	60	26	3	1	-
Monroe	1,937	2	15	24	56	89	111	*295*	739	593	259	39	10	-
Montcalm	783	1	5	8	20	47	51	*131*	333	223	81	12	2	-
Montmorency	96	-	-	1	3	7	6	*17*	36	30	11	1	1	-
Muskegon	2,542	10	27	43	79	115	144	*408*	938	785	328	66	6	1
Newaygo	539	-	-	14	16	29	39	*98*	201	161	56	18	5	-
Oakland	13,917	11	48	114	184	325	478	*1,149*	3,978	5,054	2,988	653	84	-
Oceana	378	3	2	4	14	19	16	*55*	160	106	43	10	1	-
Ogemaw	282	1	1	5	4	13	25	*48*	125	74	26	5	3	-
Ontonagon	131	-	-	7	5	6	5	*23*	47	40	13	7	1	-
Osceola	346	1	1	6	7	9	15	*38*	136	106	44	18	3	-
Oscoda	103	-	-	1	5	6	5	*17*	35	35	10	4	2	-
Otsego	272	-	1	2	5	13	14	*35*	107	81	36	12	1	-
Ottawa	2,740	2	3	32	47	64	99	*245*	890	1,068	465	62	8	-
Presque Isle	222	1	2	3	1	9	14	*29*	80	73	27	11	1	-
Roscommon	240	-	-	3	6	16	15	*40*	96	60	34	9	1	-
Saginaw	3,636	12	36	71	115	155	173	*550*	1,241	1,200	532	82	18	1
St. Clair	2,005	1	6	18	56	89	81	*250*	771	648	271	55	9	-
St. Joseph	912	1	4	8	33	47	38	*130*	353	281	120	22	5	-
Sanilac	625	-	3	9	17	29	31	*89*	231	209	79	15	2	-
Schoolcraft	127	1	1	1	2	8	8	*20*	50	40	8	5	3	-
Shiawassee	1,063	-	3	12	23	31	60	*129*	380	355	161	32	6	-
Tuscola	871	-	3	10	21	39	51	*124*	327	280	108	29	3	-
Van Buren	1,180	4	10	20	33	54	70	*187*	430	371	145	37	6	-
Washtenaw	3,887	3	11	30	67	96	135	*339*	1,054	1,421	860	187	23	-
Wayne	34,120	140	341	684	1,028	1,456	1,744	*5,253*	11,415	10.566	5.263	1,269	211	3
Wexford	434	2	1	6	11	22	34	*74*	161	133	54	9	1	-
County Not Stated	11	-	-	1	-	1	1	*3*	5	1	2	-	-	-

TABLE 4.13
Vital Statistics for Residents of Selected Michigan Cities[1], 1981

AREA	LIVE BIRTHS	DEATHS	INFANT DEATHS		FETAL DEATHS	
			NUMBER	RATE	NUMBER	RATIO
Allen Park	339	281	2	5.9	4	11.8
Ann Arbor	1,361	487	18	13.2	7	5.1
Battle Creek	793	472	16	20.2	7	8.8
Bay City	781	449	8	10.2	5	6.4
Burton City	387	210	7	18.1	2	5.2
Dearborn	1,093	1,053	12	11.0	9	8.2
Dearborn Heights	653	560	7	10.7	3	4.6
Detroit	18,953	13,811	415	21.9	170	9.0
East Detroit	456	418	4	8.8	1	2.2
East Lansing	485	127	3	6.2	-	-
Farmington Hills	640	363	5	7.8	4	6.3
Ferndale	458	270	5	10.9	3	6.6
Flint	3,596	1,534	71	19.7	46	12.8
Garden City	481	192	3	6.2	4	8.3
Grand Rapids	3,726	1,823	48	12.9	36	9.7
Highland Park	449	319	10	22.3	3	6.7
Holland	466	207	7	15.0	5	10.7
Inkster	559	295	9	16.1	3	5.4
Jackson	721	479	9	12.5	6	8.3
Kalamazoo	1,449	655	22	15.2	8	5.5
Kentwood	425	133	-	-	2	4.7
Lansing	2,594	973	34	13.1	31	12.0
Lincoln Park	623	397	7	11.2	7	11.2
Livonia	1,067	729	4	3.7	8	7.5
Madison Heights	503	262	10	19.9	5	9.9
Midland	578	236	7	12.1	3	5.2
Muskegon	821	488	17	20.7	12	14.6
Oak Park	478	308	5	10.5	1	2.1
Pontiac	1,562	702	36	23.0	18	11.5
Portage	513	181	5	9.7	2	3.9
Port Huron	616	359	8	13.0	5	8.1
Roseville	797	425	13	16.3	5	6.3
Royal Oak	1,042	680	12	11.5	3	2.9
Saginaw	1,624	720	39	24.0	17	10.5
St. Clair Shores	793	686	9	11.3	3	3.8
Southfield	777	713	11	14.2	5	6.4
Southgate	374	214	3	8.0	4	10.7
Sterling Heights	1,566	471	20	12.8	15	9.6
Taylor	1,190	429	8	6.7	7	5.9
Troy	903	345	10	11.1	4	4.4
Warren	1,804	1,207	25	13.9	9	5.0
Westland	1,287	525	13	10.1	6	4.7
Wyandotte	510	347	7	13.7	2	3.9
Wyoming	1,129	336	17	15.1	6	5.3

[1] 25,000 population or over according to the 1980 census.

Table 4.14
Number of Deaths by Underlying Cause and County of Residence, Michigan, 1981

AREA	All Causes	Tuberculosis All Forms	All Other Infectious and Parasitic Diseases	MALIGNANT NEOPLASMS							
				Total	Digestive Organs and Peritoneum	Respiratory and Intrathoracic Organs	Breast	Genital Organs	Urinary Organs	Leukemia	Other
STATE	75,818	53	632	16,142	4,162	4,231	1,457	1,762	689	595	3,246
Alcona	118	1	1	21	6	5	2	2	1	-	5
Alger	110	-	-	22	8	5	2	2	1	1	3
Allegan	598	1	10	134	41	29	8	15	8	5	28
Alpena	274	-	5	57	14	14	5	4	1	-	19
Antrim	181	-	-	40	11	8	1	8	1	1	10
Arenac	179	-	1	43	11	13	5	3	2	-	9
Baraga	106	-	-	21	5	8	1	-	-	1	6
Barry	333	1	6	73	14	11	6	12	7	5	18
Bay	928	1	7	193	40	45	25	15	8	4	56
Benzie	113	1	2	19	5	3	1	2	-	2	6
Berrien	1483	1	11	321	74	88	29	38	19	12	61
Branch	361	-	2	84	24	17	7	9	5	2	20
Calhoun	1248	-	10	276	51	83	30	32	18	10	52
Cass	404	-	2	85	28	20	6	8	6	-	17
Charlevoix	190	-	-	46	7	9	6	9	4	2	9
Cheboygan	215	-	3	45	9	12	6	6	2	2	8
Chippewa	276	1	1	58	14	12	5	10	3	3	11
Clare	273	-	1	47	10	11	6	3	3	4	10
Clinton	307	-	3	91	30	23	9	11	4	3	11
Crawford	94	-	1	11	4	1	-	3	-	-	3
Delta	363	-	2	78	17	21	8	11	3	5	13
Dickinson	305	-	5	65	19	11	6	10	-	2	17
Eaton	500	-	2	108	18	23	9	14	8	3	33
Emmet	222	-	-	46	15	11	3	4	7	-	6
Genesee	3246	1	30	715	196	187	56	80	27	31	138
Gladwin	198	-	-	54	16	9	7	5	1	-	16
Gogebic	287	-	1	55	22	15	2	5	-	3	8
Gd. Traverse	465	1	5	84	19	19	8	10	5	3	20
Gratiot	369	-	3	68	9	15	13	7	5	3	16
Hillsdale	417	-	2	102	26	25	10	12	5	3	21
Houghton	392	1	3	71	21	14	4	10	5	1	16
Huron	408	-	4	94	38	21	6	6	2	4	17
Ingham	1649	2	10	380	103	100	31	32	12	16	86
Ionia	415	1	1	88	25	22	7	13	7	2	12
Iosco	289	-	1	61	12	23	8	4	3	2	9
Iron	205	-	1	51	18	13	4	3	2	1	10
Isabella	298	-	3	54	21	10	3	7	4	2	7
Jackson	1225	1	4	257	68	76	25	21	9	6	52
Kalamazoo	1471	1	13	348	80	94	31	42	11	11	79
Kalkaska	109	-	-	24	8	8	4	3	-	1	-
Kent	3444	3	28	742	210	156	71	[illegible]	26	32	[illegible]

Table 4.14 (Continued)

AREA	All Causes	Tuberculosis All Forms	All Other Infectious and Parasitic Diseases	MALIGNANT NEOPLASMS Total	Digestive Organs and Peritoneum	Respiratory and Intrathoracic Organs	Breast	Genital Organs	Urinary Organs	Leukemia	Other
Keweenaw	31	-	-	9	4	-	1	3	-	-	1
Lake	112	-	-	15	5	5	-	4	-	-	1
Lapeer	478	-	-	103	28	23	14	15	3	1	19
Leelanau	120	-	2	31	10	6	6	-	1	-	8
Lenawee	727	-	3	152	33	48	19	15	3	6	28
Livingston	566	-	1	119	36	34	7	12	6	5	19
Luce	67	-	-	16	5	2	-	2	2	1	4
Mackinac	115	-	1	21	7	4	3	1	3	1	2
Macomb	4912	1	44	1114	269	330	96	106	49	44	220
Manistee	248	-	1	60	15	13	3	11	2	1	15
Marquette	466	-	1	93	23	25	12	4	5	2	22
Mason	296	-	1	52	16	11	3	6	2	1	13
Mecosta	209	-	1	45	9	8	5	5	2	3	13
Menominee	293	-	1	40	17	5	4	2	2	2	8
Midland	481	-	3	87	26	20	10	7	1	6	17
Missaukee	93	-	-	23	4	8	-	5	1	-	5
Monroe	[illegible]06	1	6	182	63	32	16	21	12	7	31
Montcalm	462	-	3	88	15	18	6	16	5	6	22
Montmorency	100	-	-	34	5	12	-	4	2	1	10
Muskegon	1434	3	8	299	72	73	35	34	12	12	61
Newaygo	311	-	-	83	25	17	6	10	4	3	18
Oakland	7239	2	75	1635	415	441	177	161	72	53	316
Oceana	180	-	-	39	11	14	3	3	1	2	5
Ogemaw	189	-	-	35	9	11	1	4	1	1	8
Ontonagon	105	-	-	16	3	6	-	1	-	-	6
Osceola	164	-	-	26	5	6	-	6	-	-	9
Oscoda	85	-	-	20	5	4	1	4	-	1	5
Otsego	130	-	1	21	3	6	2	3	-	2	5
Ottawa	928	2	7	212	52	50	19	21	10	13	47
Presque Isle	169	-	1	32	14	5	3	3	1	1	5
Roscommon	227	-	-	52	13	14	5	4	3	1	12
Saginaw	1673	-	17	345	82	89	43	26	9	17	79
St. Clair	1222	1	7	265	70	72	27	25	14	6	51
St. Joseph	511	-	2	110	38	20	5	17	2	4	24
Sanilac	393	-	1	73	17	25	8	8	3	3	9
Schoolcraft	103	-	1	24	5	6	2	1	2	2	6
Shiawassee	492	-	1	113	32	26	14	16	1	5	19
Tuscola	448	1	3	71	15	15	7	11	2	2	19
Van Buren	595	-	4	127	32	41	8	8	8	3	27
Washtenaw	1391	-	9	299	60	90	20	36	7	17	69
Wayne	22795	24	243	4674	1204	1295	388	540	200	171	876
Wexford	265	-	-	55	23	11	2	4	1	1	13
Co. Not Stated	19	-	-	-	-	-	-	-	-	-	-

Table 4.14 Number of Deaths by Underlying Cause and County of Residence, Michigan, 1981 (Continued)

AREA	Diabetes Mellitus	Nutritional Deficiencies	Major Cardiovascular Diseases						Pneumonia and Influenza	Chronic Obstruct. Pulmonary Diseases and Allied Conditions	Ulcer of Stomach and Duodenum	Chronic Liver Disease and Cirrhosis
			Total	Dis. of the Heart	Hypertension with or without Renal Disease	Cerebrovascular Diseases	Atherosclerosis	Other Diseases of Arteries, Arterioles, and Capillaries				
STATE	1,487	88	38,670	30,172	279	6,121	1,270	828	1,716	2,203	239	1,253
Alcona	1	-	71	54	-	10	5	2	3	3	1	5
Alger	1	-	72	53	-	11	5	3	3	1	-	1
Allegan	10	1	312	247	5	39	8	13	7	13	-	4
Alpena	6	-	145	107	1	23	6	8	6	7	-	6
Antrim	1	-	108	81	-	19	7	1	3	5	-	2
Arenac	3	-	95	79	-	12	3	1	1	2	1	1
Baraga	5	-	57	46	2	6	1	2	5	1	1	2
Barry	7	-	157	120	1	22	12	2	11	11	3	1
Bay	8	1	512	394	-	65	42	11	10	31	3	18
Benzie	1	-	62	46	1	9	4	2	1	6	2	1
Berrien	30	-	752	572	7	123	35	15	41	52	6	19
Branch	5	-	201	144	2	37	13	5	7	12	1	3
Calhoun	37	2	609	462	2	116	15	14	38	52	5	23
Cass	10	1	207	164	2	38	2	1	9	12	2	11
Charlevoix	1	1	97	85	-	9	2	1	3	6	-	4
Cheboygan	3	-	129	105	-	17	3	4	5	4	1	2
Chippewa	10	-	149	115	1	25	3	5	2	7	-	2
Clare	2	-	157	135	-	19	1	2	7	12	-	5
Clinton	6	-	142	115	-	21	4	2	7	7	-	4
Crawford	6	-	50	38	-	8	2	2	4	2	-	1
Delta	15	-	184	135	2	32	8	7	14	9	1	3
Dickinson	3	1	166	109	3	36	13	5	6	10	1	3
Eaton	7	1	272	193	3	47	22	7	10	14	1	7
Emmet	2	-	121	92	-	26	-	3	6	9	-	2
Genesee	71	1	1604	1217	16	290	58	23	70	92	11	38
Gladwin	5	-	99	78	1	12	3	5	6	5	1	-
Gogebic	5	1	171	139	-	27	1	4	10	5	2	2
Gd. Traverse	11	1	238	188	1	33	13	3	16	7	-	4
Gratiot	4	-	213	158	-	44	6	5	13	17	-	4
Hillsdale	14	-	202	149	4	35	12	2	14	12	-	2
Houghton	13	-	228	186	2	27	6	7	13	9	2	4
Huron	6	-	228	176	-	39	7	6	6	4	3	4
Ingham	49	5	770	572	8	133	35	22	39	54	3	20
Ionia	12	-	203	153	-	32	12	6	4	17	1	5
Iosco	3	-	151	119	1	20	8	3	7	13	3	2
Iron	4	-	98	79	-	14	2	3	4	9	2	1
Isabella	1	-	159	126	-	27	2	4	7	8	-	2
Jackson	25	-	654	500	6	89	45	14	21	47	1	14
Kalamazoo	30	3	712	549	9	116	16	22	54	36	5	18
Kalkaska	3	1	51	32	-	9	7	3	1	3	1	-
Kent	53	-	1831	1356	14	305	108	48	74	39	17	45

Table 4.14 (Continued)

AREA	Diabetes Mellitus	Nutritional Deficiencies	Major Cardiovascular Diseases: Total	Major Cardiovascular Diseases: Dis. of the Heart	Major Cardiovascular Diseases: Hypertension with or without Renal Disease	Major Cardiovascular Diseases: Cerebrovascular Diseases	Major Cardiovascular Diseases: Atherosclerosis	Major Cardiovascular Diseases: Other Diseases of Arteries, Arterioles, and Capillaries	Pneumonia and Influenza	Chronic Obstruct. Pulmonary Diseases and Allied Conditions	Ulcer of Stomach and Duodenum	Chronic Liver Disease and Cirrhosis
Keweenaw	-	-	13	10	-	2	-	1	2	2	-	-
Lake	4	1	69	51	1	13	1	3	1	5	-	1
Lapeer	11	-	258	190	2	51	9	6	2	20	1	8
Leelanau	5	-	63	48	-	9	3	3	1	4	-	-
Lenawee	23	-	353	247	2	76	24	4	25	24	2	10
Livingston	11	3	272	218	3	35	9	7	14	23	2	12
Luce	1	-	38	28	-	5	5	-	3	2	-	-
Mackinac	-	-	61	51	2	5	2	1	1	5	-	1
Macomb	82	2	2559	1970	21	393	115	60	87	137	10	96
Manistee	1	1	137	97	1	29	10	-	7	5	-	2
Marquette	16	1	243	189	1	39	10	4	8	15	2	3
Mason	8	-	168	134	2	17	12	3	9	5	-	7
Mecosta	2	4	106	87	-	13	5	1	6	6	-	4
Menominee	13	-	158	115	2	23	13	5	7	10	-	3
Midland	5	-	263	205	3	39	8	8	12	14	2	3
Missaukee	2	-	50	40	-	9	-	1	3	1	-	1
Monroe	31	3	452	366	-	63	12	11	19	39	5	15
Montcalm	11	2	251	185	3	54	4	5	11	10	4	4
Montmorency	6	-	42	27	-	13	-	2	2	4	-	1
Muskegon	30	2	725	540	13	143	18	11	33	54	4	16
Newaygo	4	1	152	114	-	28	8	2	9	14	2	1
Oakland	125	9	3677	2961	18	547	65	86	148	222	28	97
Oceana	6	-	83	73	-	6	3	1	7	6	1	3
Ogemaw	2	-	110	89	2	14	4	1	3	6	-	3
Ontonagon	2	-	71	52	-	9	9	1	2	1	-	-
Osceola	2	-	99	72	-	19	7	1	3	5	-	1
Oscoda	3	-	46	28	1	12	3	2	1	1	-	1
Otsego	4	-	65	51	-	13	-	1	5	-	-	3
Ottawa	24	1	440	325	2	67	34	12	22	18	3	6
Presque Isle	1	2	96	76	-	15	-	5	4	5	-	1
Roscommon	5	-	119	87	2	23	3	4	8	3	1	2
Saginaw	30	-	841	625	12	144	42	18	40	45	4	37
St. Clair	33	5	643	494	4	103	24	18	27	34	2	13
St. Joseph	8	3	258	188	2	47	17	4	16	11	2	3
Sanilac	9	-	223	166	-	39	12	6	2	14	1	8
Schoolcraft	1	-	60	45	-	11	-	4	4	3	1	1
Shiawassee	7	1	268	193	2	61	9	3	5	13	3	4
Tuscola	8	2	226	183	1	32	3	7	7	17	-	3
Van Buren	11	2	292	236	2	42	4	8	16	21	2	5
Washtenaw	21	3	653	487	2	137	15	12	32	45	4	15
Wayne	428	20	11382	9263	78	1668	180	193	519	610	70	562
Wexford	1	-	142	96	1	29	11	5	13	9	2	2
Co. Not Stated	1	-	4	2	-	2	-	-	2	-	-	-

Table 4.14 Number of Deaths by Underlying Cause and County of Residence, Michigan, 1981 (Continued)

AREA	Nephritis, Nephrotic Syndrome and Nephrosis	Complications of Pregnancy, Childbx. and the Puerperium	Congenital Anomalies	Certain Conditions Originating in the Perinatal Period	Symptoms, Signs, and Ill-defined Conditions	All Other Dis.	ACCIDENTS Total	ACCIDENTS Motor Vehicle	ACCIDENTS All Other	Suicide	Homicide and Legal Intervention	All Other External Causes
STATE	665	7	501	1,028	458	5,185	3,390	1,727	1,663	1,074	938	89
Alcona	3	-	-	-	-	2	4	3	1	1	1	-
Alger	-	-	2	-	-	5	2	1	1	1	-	-
Allegan	5	-	6	6	11	36	35	20	15	5	2	-
Alpena	2	-	1	5	1	13	18	3	15	2	-	-
Antrim	-	-	1	-	-	14	7	4	3	-	-	-
Arenac	1	-	2	6	1	8	9	5	4	4	1	-
Baraga	-	-	-	-	-	8	2	1	1	4	-	-
Barry	7	-	6	3	6	20	14	10	4	7	-	-
Bay	8	-	7	5	2	49	53	24	29	14	5	1
Benzie	-	-	1	1	-	10	5	4	1	1	-	-
Berrien	12	1	8	20	7	93	77	52	25	15	15	2
Branch	2	-	1	2	3	24	12	8	4	2	-	-
Calhoun	11	-	5	15	11	74	52	25	27	17	10	1
Cass	2	-	1	2	1	27	19	8	11	11	2	-
Charlevoix	2	-	-	4	2	14	7	4	3	3	-	-
Cheboygan	-	-	1	7	-	9	4	1	3	-	2	-
Chippewa	1	-	1	3	1	20	15	14	1	2	3	-
Clare	3	-	2	3	1	12	15	12	3	6	-	-
Clinton	-	-	1	4	6	13	16	9	7	6	1	-
Crawford	2	-	1	4	-	4	6	1	5	1	1	-
Delta	1	-	3	-	1	30	16	8	8	5	1	-
Dickinson	2	-	-	2	-	21	15	7	8	4	1	-
Eaton	5	-	3	3	2	27	31	18	13	6	1	-
Emmet	2	-	2	5	-	11	14	5	9	1	1	-
Genesee	28	1	30	66	31	231	139	76	63	41	42	4
Gladwin	3	-	2	1	1	12	7	5	2	2	-	-
Gogebic	2	-	-	2	2	16	10	3	7	3	-	-
Gd. Traverse	5	-	2	7	3	40	28	20	8	13	-	-
Gratiot	5	-	3	2	2	18	15	10	5	1	-	1
Hillsdale	3	-	3	2	2	28	21	12	9	7	3	-
Houghton	2	-	-	2	1	31	9	5	4	2	1	-
Huron	9	-	1	3	2	15	25	16	9	4	-	-
Ingham	14	1	22	20	22	109	81	29	52	32	15	1
Ionia	6	-	4	7	2	35	20	16	4	8	1	-
Iosco	5	-	3	4	3	17	11	3	8	5	-	-
Iron	1	-	-	-	1	22	6	1	5	3	2	-
Isabella	3	-	4	3	4	22	21	15	6	6	1	-
Jackson	6	-	9	13	8	76	57	33	24	21	11	-
Kalamazoo	6	-	13	23	6	112	61	31	30	25	5	-
Kalkaska	-	-	-	4	-	9	10	4	6	[illegible]	-	-
Kent	23	-	29	54	[illegible]	214	151	80	[illegible]	[illegible]	25	3

Table 4.14 (Continued)

AREA	Nephritis, Nephrotic Syndrome and Nephrosis	Complications of Pregnancy, Childbx. and the Puerperium	Congenital Anomalies	Certain Conditions Originating in the Perinatal Period	Symptoms, Signs, and Ill-defined Conditions	All Other Dis.	ACCIDENTS			Suicide	Homicide and Legal Intervention	All Other External Causes
							Total	Motor Vehicle	All Other			
Keweenaw	1	-	-	1	-	3	-	-	-	-	-	-
Lake	-	-	-	-	-	7	7	4	3	1	1	-
Lapeer	6	-	3	9	2	32	18	9	9	5	-	-
Leelanau	1	-	-	1	-	5	6	2	4	1	-	-
Lenawee	9	-	6	8	4	45	48	21	27	11	3	1
Livingston	6	-	4	2	7	44	38	32	6	7	1	-
Luce	-	-	-	-	-	6	1	1	-	-	-	-
Mackinac	1	-	-	2	-	3	16	8	8	2	1	-
Macomb	56	-	34	56	22	306	201	119	82	73	31	1
Manistee	3	-	2	2	1	13	12	7	5	1	-	-
Marquette	1	-	1	6	4	29	35	21	14	6	2	-
Mason	-	-	1	3	-	27	14	6	8	1	-	-
Mecosta	-	-	2	3	-	16	12	7	5	2	-	-
Menominee	2	-	2	2	5	17	24	11	13	9	-	-
Midland	6	1	6	6	3	44	21	12	9	5	-	-
Missaukee	-	-	-	1	-	8	3	1	2	1	-	-
Monroe	4	1	4	16	4	68	38	18	20	13	5	-
Montcalm	3	-	3	5	6	29	29	18	11	2	1	-
Montmorency	-	-	1	-	-	7	2	-	2	1	-	-
Muskegon	12	-	9	26	5	104	70	41	29	17	16	1
Newaygo	3	-	2	1	3	15	16	7	9	4	1	-
Oakland	45	-	50	93	31	466	365	189	176	123	46	2
Oceana	4	-	2	2	2	6	14	7	7	4	1	-
Ogemaw	3	-	2	3	2	8	7	3	4	4	1	-
Ontonagon	1	-	-	1	1	6	2	2	-	2	-	-
Osceola	1	-	-	2	1	8	11	4	7	5	-	-
Oscoda	-	-	-	-	-	4	6	4	2	1	2	-
Otsego	3	-	1	3	1	11	8	2	6	3	1	-
Ottawa	8	-	9	17	17	78	50	31	19	12	2	-
Presque Isle	3	-	1	2	-	10	10	2	8	-	1	-
Roscommon	5	-	3	-	1	12	11	7	4	5	-	-
Saginaw	14	-	19	36	8	98	98	36	62	14	27	-
St. Clair	13	-	6	13	5	85	48	26	22	20	2	-
St. Joseph	1	-	1	7	-	47	33	20	13	6	3	-
Sanilac	8	-	3	2	2	15	22	9	13	9	1	-
Schoolcraft	3	-	-	-	1	2	2	1	1	-	-	-
Shiawassee	2	-	1	1	2	32	35	22	13	3	1	-
Tuscola	4	-	4	5	2	33	46	20	26	10	5	1
Van Buren	7	-	2	2	7	51	30	15	15	14	2	-
Washtenaw	8	-	5	30	11	132	72	33	39	39	11	2
Wayne	226	2	130	342	130	1678	777	338	439	297	614	67
Wexford	-	-	1	-	1	22	10	5	5	6	1	-
Co. Not Stated	-	-	1	4	-	2	2	-	2	-	2	1

Table 4.15
Reported Cases of Certain Communicable Diseases by County
Michigan Residents, 1981

AREA	TOTAL	GONOR-RHEA	CHICK-EN POX	STREP[1]	HEPA-TITIS (ALL TYPES)	SAMO-NELLA INFEC-TIONS	TUBER-CULO-SIS	SYPHI-LIS	MUMPS	DYSEN-TERY BACIL-LARY	MEAS-LES	RU-BELLA	MENIN-GOCOC-CAL INFEC-TIONS	WHOOP-ING COUGH	ALL OTHER[2]
STATE	83,587	32,524	30,449	13,529	1,700	1,364	931	1,053	416	256	34	44	93	30	1,164
Alcona	21	16	-	-	3	-	1	-	-	-	-	-	-	-	1
Alger	122	3	101	14	2	-	-	-	2	-	-	-	-	-	-
Allegan	554	62	312	141	11	8	1	3	4	4	1	-	-	1	6
Alpena	60	21	20	10	-	2	3	-	-	-	-	-	-	-	4
Antrim	52	3	20	24	2	1	-	-	-	-	-	1	-	-	1
Arenac	111	4	34	61	2	3	1	1	3	-	-	-	-	-	2
Baraga	20	1	17	-	1	1	-	-	-	-	-	-	-	-	-
Barry	297	20	218	39	10	3	1	1	1	-	-	-	2	-	2
Bay	861	114	478	186	20	15	11	3	3	12	-	-	-	-	19
Benzie	83	3	29	45	-	1	1	1	1	-	-	1	-	-	1
Berrien	1,949	917	776	70	59	49	25	28	4	5	-	-	1	-	15
Branch	638	28	476	122	4	3	1	-	1	1	-	-	-	-	2
Calhoun	1,249	403	652	55	30	19	8	6	8	48	1	-	1	-	18
Cass	325	38	228	26	9	3	8	1	3	-	1	1	2	-	5
Charlevoix	21	4	5	6	1	1	1	1	-	-	-	-	-	-	2
Cheboygan	330	13	285	21	7	-	1	-	3	-	-	-	-	-	-
Chippewa	351	17	191	134	2	1	-	3	1	-	-	2	-	-	-
Clare	37	15	11	-	3	1	3	-	1	-	2	-	-	-	1
Clinton	103	24	33	20	11	5	-	1	-	1	-	-	1	-	7
Crawford	47	10	6	26	1	-	-	-	3	-	-	-	-	-	1
Delta	288	36	83	155	-	2	3	2	3	1	-	-	-	-	3
Dickinson	329	14	262	37	1	2	3	-	3	-	-	-	-	-	7
Eaton	547	36	336	136	7	19	2	-	4	-	-	-	-	-	7
Emmet	54	16	4	32	1	-	-	-	-	-	-	-	-	-	1
Genesee	5,027	3,010	927	804	50	52	40	23	28	25	1	5	4	6	52
Gladwin	83	3	71	1	2	1	1	2	-	-	-	-	-	-	2
Gogebic	58	6	2	44	1	-	5	-	-	-	-	-	-	-	-
Gd. Traverse	351	17	265	55	2	1	4	-	3	-	3	-	-	-	1
Gratiot	102	26	25	20	6	4	1	3	3	-	-	-	-	-	14
Hillsdale	236	39	109	62	8	2	2	-	6	3	-	-	-	1	4
Houghton	479	15	244	200	5	9	-	-	3	-	1	1	-	-	1
Huron	265	3	245	8	6	-	2	1	-	-	-	-	-	-	-
Ingham	1,988	1,385	244	36	69	153	21	36	4	13	-	3	-	5	19
Ionia	430	22	329	54	8	4	2	2	3	-	-	-	-	-	6
Iosco	394	7	4	372	4	2	-	-	2	2	-	-	-	-	1
Iron	48	-	9	35	-	-	3	1	-	-	-	-	-	-	-
Isabella	142	42	18	41	12	15	2	1	2	2	-	-	1	-	6
Jackson	1,163	456	479	137	15	22	10	13	9	-	-	-	-	-	22
Kalamazoo	1,965	966	511	300	45	21	9	12	2	2	1	-	4	3	89
Kalkaska	130	-	103	24	2	-	-	-	1	-	-	-	-	-	-
Kent	5,045	1,944	1,885	912	75	50	39	35	11	13	2	2	8	-	69
Keweenaw	33	1	28	2	-	-	-	-	2	-	-	-	-	-	-

TABLE 4.15 (continued)

AREA	TOTAL	GONOR-RHEA	CHICK-EN POX	STREP[1]	HEPA-TITIS (ALL TYPES)	SAMO-NELLA INFEC-TIONS	TUBER-CULO-SIS	SYPHI-LIS	MUMPS	DYSEN-TERY BACIL-LARY	MEAS-LES	RU-BELLA	MENIN-GOCOC-CAL INFEC-TIONS	WHOOP-ING COUGH	ALL OTHER[2]
Lake	66	16	49	-	-	-	1	-	-	-	-	-	-	-	-
Lapeer	478	24	383	57	2	1	1	2	1	-	-	-	1	-	6
Leelanau	52	4	39	4	-	-	1	1	-	-	-	1	1	-	1
Lenawee	214	70	48	51	16	17	3	-	-	-	-	-	1	-	8
Livingston	687	44	294	305	16	18	3	-	3	-	-	-	1	-	3
Luce	39	3	17	18	1	-	-	-	-	-	-	-	-	-	-
Mackinac	80	20	52	7	-	-	-	-	1	-	-	-	-	-	-
Macomb	3,456	450	2,084	571	117	75	37	25	10	3	6	2	4	2	70
Manistee	52	6	25	18	1	1	-	1	-	-	-	-	-	-	-
Marquette	1,003	56	37	878	6	9	1	5	2	-	-	-	2	-	7
Mason	128	56	30	34	4	-	1	1	2	-	-	-	-	-	-
Mecosta	203	39	143	11	-	8	-	1	-	-	-	-	-	-	1
Menominee	231	11	162	52	-	1	2	-	2	-	-	-	-	-	1
Midland	473	48	334	55	13	8	3	2	3	-	1	-	2	-	4
Missaukee	47	5	33	8	1	-	-	-	-	-	-	-	-	-	-
Monroe	787	130	530	74	21	6	4	2	4	-	1	-	1	-	14
Montcalm	179	24	141	3	6	-	1	1	1	-	-	-	1	-	1
Montmorency	44	2	28	9	1	-	-	1	1	-	-	2	-	-	-
Muskegon	1,541	696	435	227	54	41	20	6	11	11	2	-	3	3	32
Newaygo	282	21	195	53	4	4	-	-	-	1	-	2	-	-	2
Oakland	10,260	1,750	4,355	3,296	271	120	83	64	21	19	4	12	12	1	252
Oceana	74	5	44	16	6	1	-	1	-	-	-	-	1	-	-
Ogemaw	26	15	-	3	3	3	-	-	-	2	-	-	-	-	-
Ontonagon	208	-	204	4	-	-	-	-	-	-	-	-	-	-	-
Osceola	118	5	105	4	-	-	1	-	3	-	-	-	-	-	-
Oscoda	17	11	2	1	3	-	-	-	-	-	-	-	-	-	-
Otsego	190	4	131	45	3	2	-	-	4	-	1	-	-	-	-
Ottawa	1,006	148	592	168	24	26	13	5	3	4	-	-	2	1	20
Presque Isle	55	5	35	10	2	-	1	-	-	-	-	-	2	-	-
Roscommon	25	6	1	9	2	3	1	-	1	-	-	-	2	-	-
Saginaw	2,519	1,424	810	139	46	36	20	17	1	5	-	-	3	-	18
St. Clair	828	214	423	107	11	18	23	4	8	7	-	1	1	-	11
St. Joseph	395	52	286	26	8	2	8	3	-	-	-	1	-	3	6
Sanilac	65	6	49	1	4	1	3	-	1	-	-	-	-	-	-
Schoolcraft	184	7	39	135	-	2	1	-	-	-	-	-	-	-	-
Shiawassee	482	30	253	175	8	11	1	-	-	-	-	-	-	-	4
Tuscola	416	21	314	64	2	2	2	-	4	-	-	1	2	-	4
Van Buren	614	71	349	142	12	10	7	1	3	3	-	-	3	1	12
Washtenaw	1,443	959	161	172	42	42	23	13	4	11	-	1	1	-	14
Wayne	28,098	16,284	7,113	2,077	468	421	451	717	193	58	6	4	23	3	280
Wexford	115	22	49	32	7	-	-	-	2	-	-	1	-	-	2
State Homes	19	-	-	1	18	-	-	-	-	-	-	-	-	-	-

[1] Streptococcal Sore Throat (including Scarlet Fever).

[2] Includes: Meningitis, Aseptic - 537; Meningitis, (Influenzal) - 198; Meningitis, Excluding Aseptic - 181; Staphylococcal Infections - 97; Encephalitis, Infectious. - 69; Malaria - 30; Typhoid Fever - 26; Dysentery, Amebic - 8; Psittacosis - 3; Tetanus - 3; Undulant Fever - 2; Leprosy - 2; Ringworm - 2; Rocky Mountain Spotted Fever - 1; Trichinosis - 1; Tularemia - 1; Food Poisoning - 1; Diarrhea Epidemic Infants (under 1 year) - 1; Leptospirosis - 1

Table 6.16 Number of Deaths by Cause, Michigan Residents, 1981

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
	I. INFECTIOUS AND PARASITIC DISEASES (001-139)	
2	Typhoid and paratyphoid fevers	1
3	Other salmonella infections	1
8	Intestinal infections due to other organisms	7
9	Ill-defined intestinal infections	6
11	Pulmonary tuberculosis	41
13	Tuberculosis of meninges and central nervous system	2
14	Tuberculosis of intestines, peritoneum and mesenteric glands	1
15	Tuberculosis of bones and joints	2
17	Tuberculosis of other organs	4
18	Miliary tuberculosis	3
27	Other zoonotic bacterial diseases	3
31	Diseases due to other mycobacteria	2
36	Meningococcal infection	12
38	Septicemia	443
40	Other bacterial diseases	7
41	Bacterial infection in conditions classified elsewhere and of unspecified site	4
46	Slow virus infection of central nervous system	12
49	Other non-arthropod-borne viral diseases of central nervous system	6
52	Chickenpox	2
53	Herpes zoster	3
54	Herpes simplex	6
70	Viral hepatitis	35
78	Other diseases due to viruses and Chlamydiae	6
79	Viral infection in conditions classified elsewhere and of unspecified site	7
84	Malaria	1
93	Cardiovascular syphilis	2
94	Neurosyphilis	2
98	Gonococcal infections	1
112	Candidiasis	12
116	Blastomycotic infection	1
117	Other mycoses	15
134	Other infestation	1
135	Sarcoidosis	10
136	Other and unspecified infectious and parastic diseases	9
137	Late effects of tuberculosis	12
138	Late effects of acute poliomyelitis	2
139	Late effects of other infectious and parasitic diseases	1
	II. NEOPLASMS (140-239)	
140	Malignant neoplasm of lip	8
141	Malignant neoplasm of tongue	56
142	Malignant neoplasm of major salivary glands	19
143	Malignant neoplasm of gum	3
144	Malignant neoplasm of floor of mouth	20
145	Malignant neoplasm of other and unspecified parts of mouth	40
146	Malignant neoplasm of oropharynx	32
147	Malignant neoplasm of nasopharynx	22
148	Malignant neoplasm of hypopharynx	19
149	Malignant neoplasm of other and ill-defined sites within the lip, oral cavity and pharynx	51
150	Malignant neoplasm of oesophagus	352
151	Malignant neoplasm of stomach	535
152	Malignant neoplasm of small intestine, including duodenum	30
153	Malignant neoplasm of colon	1629
154	Malignant neoplasm of rectum, rectosigmoid junction and anus	333
155	Malignant neoplasm of liver and intrahepatic bile ducts	216
156	Malignant neoplasm of gallbladder and extrahepatic bile ducts	183
157	Malignant neoplasm of pancreas	788
158	Malignant neoplasm of retroperitoneum and peritoneum	22
159	Malignant neoplasm of other and ill-defined sites within the digestive organs and peritoneum	74
160	Malignant neoplasm of nasal cavities, middle ear and accessory sinuses	22
161	Malignant neoplasm of larynx	156
162	Malignant neoplasm of trachea, bronchus and lung	4026
163	Malignant neoplasm of pleura	15
164	Malignant neoplasm of thymus, heart and mediastinum	11
165	Malignant neoplasm of other and ill-defined sites within the respiratory system and intrathoracic organs	1
170	Malignant neoplasm of bone and articular cartilage	42
171	Malignant neoplasm of connective and other soft tissue	100
172	Malignant melanoma of skin	172
173	Other malignant neoplasm of skin	42
174	Malignant neoplasm of female breast	1446
175	Malignant neoplasm of male breast	11
179	Malignant neoplasm of uterus, part unspecified	114
180	Malignant neoplasm of cervix uteri	191
181	Malignant neoplasm of placenta	1
182	Malignant neoplasm of body of uterus	125
183	Malignant neoplasm of ovary and other uterine adnexa	406
184	Malignant neoplasm of other and unspecified female genital organs	38
185	Malignant neoplasm of prostate	862
186	Malignant neoplasm of testis	17
187	Malignant neoplasm of penis and other male genital organs	8
188	Malignant neoplasm of bladder	381
189	Malignant neoplasm of kidney and other and unspecified urinary organs	308
190	Malignant neoplasm of eye	9
191	Malignant neoplasm of brain	429
192	Malignant neoplasm of other and unspecified parts of nervous system	17
193	Malignant neoplasm of thyroid gland	40
194	Malignant neoplasm of other endocrine glands	11
195	Malignant neoplasm of other and ill-defined sites	116
199	Malignant neoplasm without specification of site	1091
200	Lymphosarcoma and reticulosarcoma	202
201	Hodgkin's disease	88
202	Other malignant neoplasm of lympoid and histiocytic tissue	[illegible]
203	Multiple myeloma and immunoproliferative neoplasms	[illegible]
204	Lymphoid leukemia	[illegible]
205	Myeloid leukemia	[illegible]
206	Monocytic leukemia	[illegible]
207	Other specified leukemia	11
208	Leukemia of unspecified cell type	[illegible]
211	Benign neoplasm of other parts of digestive system	[illegible]
212	Benign neoplasm of respiratory and intrathoracic organs	7
213	Benign neoplasm of bone and articular cartilage	[illegible]
219	Other benign neoplasm of uterus	1
220	Benign neoplasm of ovary	[illegible]
225	Benign neoplasm of brain and other parts of nervous system	[illegible]
226	Benign neoplasm of thyroid gland	1
227	Benign neoplasm of other endocrine glands and related structures	4
228	Hemangioma and lymphangioma, any site	5
235	Neoplasm of uncertain behavior of digestive and respiratory systems	6
237	Neoplasm of uncertain behavior of endocrine glands and nervous system	3
238	Neoplasm of uncertain behavior of other and unspecified sites and tissues	36
239	Neoplasm of unspecified nature	41
	III. ENDOCRINE, NUTRITIONAL AND METOBOLIC DISEASES AND IMMUNITY DISORDERS (240-279)	
240	Simple and unspecified goitre	1
241	Nontoxic nodular goitre	1
242	Thyrotoxicosis with or without goitre	7
244	Acquired hypothyroidism	27
250	Diabetes mellitus	1487
251	Other disorders of pancreatic internal secretion	5
252	Disorders of parathyroid gland	5
253	Disorders of the pituitary gland and its hypothalamic control	6
255	Disorders of adrenal glands	10
259	Other endocrine disorders	6
260	Kwashiorkor	[illegible]
261	Nurtritional marasmus	[illegible]
263	Other and unspecified protein-calorie malnutrition	[illegible]
268	Vitamin D deficiency	[illegible]
269	Other nutritional deficiencies	1
270	Disorders of amino-acid transport and metabolism	4
271	Disorders of carbohydrate transport and metabolism	3
272	Disorders of lipoid metabolism	11
273	Disorders of plasma protein metabolism	14
274	Gout	6
275	Disorders of mineral metabolism	9
276	Disorders of fluid, electrolyte and acid-base balance	152
277	Other and unspecified disorders of metabolism	48
278	Obesity and other hyperalimentation	42
279	Disorders involving the immune mechanism	9
	IV. DISEASES OF BLOOD AND BLOOD-FORMING ORGANS (280-289)	
280	Iron deficiency anemias	3
281	Other deficiency anemias	4
282	Hereditary hemolytic anemias	24
283	Acquired hemolytic anemias	9
284	Aplastic anemia	48
285	Other and unspecified anemias	54
286	Coagulation defects	32
287	Purpura and other hemorrhagic conditons	22
288	Diseases of white blood cells	11
289	Other diseases of blood and blood-forming organs	41
	V. MENTAL DISORDERS (290-319)	
290	Senile and presenile organic psychotic conditions	56
291	Alcoholic psychoses	12
295	Schizophrenic psychoses	7
296	Affective psychoses	1
298	Other nonorganic psychoses	11
300	Neurotic disorders	5
303	Alcohol dependence syndrome	93
304	Drug dependence	15
305	Nondependent abuse of drugs	181
307	Special symptoms or syndromes not elsewhere classified	3
308	Acute reaction to stress	1
310	Specific nonpsychotic mental disorders following organic brain damage	127
311	Depressive disorder, not elswhere classified	6
318	Other specified mental retardation	2
319	Unspecified mental retardation	17
	VI. DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS (320-389)	
320	Bacterial meningitis	24
322	Meningitis of unspecified cause	[illegible]
323	Encephalitis, myelitis and encephalomyelitis	[illegible]
324	Intracranial and intraspinal abscess	[illegible]
325	Phlebitis and thrombophlebitis of intracranial	[illegible]

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1981 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
	venous sinuses	2
326	Late effects of intracranial abscess or pyogenic infection	1
330	Cerebral degenerations usually manifest in childhood	6
331	Other cerebral degenerations	99
332	Parkinson's disease	120
333	Other extrapyramidal disease and abnormal movement disorders	18
334	Spinocerebellar disease	6
335	Anterior horn cell disease	117
336	Other diseases of spinal cord	10
340	Multiple sclerosis	70
341	Other demyelinating diseases of central nervous system	5
342	Hemiplegia	18
343	Infantile cerebral palsy	18
344	Other paralytic syndromes	31
345	Epilepsy	99
348	Other conditions of brain	117
349	Other and unspecified disorders of the nervous system	5
350	Trigeminal nerve disorders	1
352	Disorders of other cranial nerves	1
355	Mononeuritis of lower limb	1
356	Hereditary and idiopathic peripheral neuropathy	6
357	Inflammatory and toxic neuropathy	9
358	Myoneural disorders	11
359	Muscular dystrophies and other myopathies	35
382	Suppurative and unspecified otitis media	3
383	Mastoiditis and related conditions	1
386	Vertiginous syndromes and other disorders of vestibular system	1
	VII. DISEASES OF THE CIRCULATORY SYSTEM (390-459)	
390	Rheumatic fever without mention of heart involvement	1
391	Rheumatic fever with heart involvement	2
393	Chronic rheumatic pericarditis	1
394	Diseases of mitral valve	90
395	Diseases of aortic valve	17
396	Diseases of mitral and aortic valves	40
397	Diseases of other endocardial structures	21
398	Other rheumatic heart disease	103
401	Essential hypertension	123
402	Hypertensive heart disease	695
403	Hypertensive renal disease	156
404	Hypertensive heart and renal disease	110
410	Acute myocardial infarction	12274
411	Other acute and subacute form of ischemic heart disease	73
412	Old myocardial infarction	43
413	Angina pectoris	20
414	Other forms of chronic ischemic heart disease	9899
415	Acute pulmonary heart disease	384
416	Chronic pulmonary heart disease	71
417	Other diseases of pulmonary circulation	1
421	Acute and subacute endocarditis	33
422	Acute myocarditis	5
423	Other diseases of pericardium	18
424	Other diseases of endocardium	270
425	Cardiomyopathy	396
426	Conduction disorders	25
427	Cardiac dysrhythmias	1189
428	Heart failure	1143
429	Ill-defined descriptions and complications of heart disease	3248
430	Subarachnoid hemorrhage	289
431	Intracerebral hemorrhage	663
432	Other and unspecified intracranial hemorrhage	90
433	Occlusion and stenosis of precerebral arteries	79
434	Occlusion of cerebral arteries	1393
435	Transcient cerebral ischemia	21
436	Acute but ill-defined cerebrovascular disease	2782
437	Other and ill-defined cerebrovascular disease	539
438	Late effects of cerebrovascular disease	265
440	Atherosclerosis	1270
441	Aortic aneurysm	580
442	Other aneurysm	33
443	Other peripheral vascular disease	74
444	Arterial embolism and thrombosis	64
446	Polyarteritis nodosa and allied conditions	25
447	Other disorders of arteries and arterioles	51
448	Diseases of capillaries	1
451	Phlebitis and thrombophlebitis	63
452	Portal vein thrombosis	3
453	Other venous embolism and thrombosis	17
454	Varicose veins of lower extremities	8
456	Varicose veins of other sites	18
457	Noninfective disorders of lymphatic channels	2
458	Hypotension	34
459	Other disorders of circulatory system	29
	VIII. DISEASES OF THE RESPIRATORY SYSTEM (460-519)	
460	Acute nasopharyngitis [common cold]	2
464	Acute laryngitis and tracheitis	3
465	Acute upper respiratory infections of multiple or unspecified site	10
466	Acute bronchitis and bronchiolitis	11
473	Chronic sinusitis	1
474	Chronic disease of tonsils and adenoids	1
478	Other diseases of upper respiratory tract	11
480	Viral pneumonia	24
481	Pneumococcal pneumonia	67
482	Other bacterial pneumonia	63
483	Pneumonia due to other specified organism	7
485	Bronchopneumonia, organism unspecified	221

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
486	Pneumonia, organism unspecified	1262
487	Influenza	72
490	Bronchitis, not specified as acute or chronic	16
491	Chronic bronchitis	110
492	Emphysema	521
493	Asthma	110
494	Bronchiectasis	25
495	Extrinsic allergic alveolitis	1
496	Chronic airways obstruction, not elsewhere classified	1420
500	Coalworkers' pneumoconiosis	6
501	Asbestosis	1
502	Pneumoconiosis due to other silica or silicates	5
503	Pneumoconiosis due to other inorganic dust	1
505	Pneumoconiosis, unspecified	4
506	Respiratory conditions due to chemical fumes and vapors	1
507	Pneumonitis due to solids and liquids	134
510	Empyema	14
511	Pleurisy	25
512	Pneumothorax	11
513	Abscess of lung and mediastinum	32
514	Pulmonary congestion and hypostasis	42
515	Postinflammatory pulmonary fibrosis	106
516	Other alveolar and parietoalveolar pneumopathy	69
518	Other diseases of lung	128
519	Other diseases of respiratory system	29
	IX. DISEASES OF THE DIGESTIVE SYSTEM (520-579)	
522	Diseases of pulp and periapical tissues	1
523	Gingival and periodontal diseases	1
527	Diseases of the salivary glands	1
530	Diseases of oesophagus	43
531	Gastric ulcer	85
532	Duodenal ulcer	81
533	Peptic ulcer, site unspecified	73
534	Gastrojejunal ulcer	5
535	Gastritis and duodenitis	36
536	Disorders of function of stomach	6
537	Other disorders of stomach and duodenum	15
540	Acute appendicitis	25
541	Appendicitis, unqualified	1
550	Inguinal hernia	11
551	Other hernia of abdominal cavity, with gangrene	5
552	Other hernia of abdominal cavity with obstruction, without mention of gangrene	10
553	Other hernia of abdominal cavity without mention of obstruction or gangrene	23
555	Regional enteritis	11
556	Idiopathic proctocolitis	15
557	Vascular insufficiency of intestine	216
558	Other noninfective gastroenteritis and colitis	39
560	Intestinal obstruction without mention of hernia	161
562	Diverticula of intestine	122
564	Functional digestive disorders, not elsewhere classified	2
566	Abscess of anal and rectal regions	8
567	Peritonitis	63
568	Other disorders of peritoneum	4
569	Other disorders of intestine	89
570	Acute and subacute necrosis of liver	19
571	Chronic liver disease and cirrhosis	1253
572	Liver abscess and sequelae of chronic liver disease	116
573	Other disorders of liver	55
574	Cholelithiasis	40
575	Other disorders of gallbladder	49
576	Other disorders of biliary tract	40
577	Diseases of pancreas	118
578	Gastrointestinal hemorrhage	202
579	Intestinal malabsorption	8
580	Acute glomerulonephritis	3
	X. DISEASES OF THE GENITOURINARY SYSTEM (580-629)	
581	Nephrotic syndrome	12
582	Chronic glomerulonephritis	56
583	Nephritis and nephropathy, not specified as acute or chronic	18
584	Acute renal failure	112
585	Chronic renal failure	167
586	Renal failure, unspecified	292
587	Renal sclerosis, unspecified	2
588	Disorders resulting from impaired renal function	3
590	Infections of kidney	60
591	Hydronephrosis	5
592	Calculus of kidney and ureter	12
593	Other disorders of kidney and ureter	81
594	Calculus of lower urinary tract	3
595	Cystitis	5
596	Other disorders of bladder	4
597	Urethritis, not sexually transmitted, and urethral syndrome	1
598	Urethral stricture	3
599	Other disorders of urethra and urinary tract	155
600	Hyperplasia of prostate	28
601	Inflammatory diseases of prostate	1
602	Other disorders of prostate	3
604	Orchitis and epididymitis	2
608	Other disorders of male genital organs	3
611	Other disorders of breast	1
614	Inflammatory disease of ovary, fallopian tube, pelvic cellular tissue and peritoneum	4
618	Genital prolapse	2
619	Fistulae involving female genital tract	4

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1981 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
	XI. COMPLICATIONS OF PREGNANCY, CHILDBIRTH, AND THE PUERPERIUM (630-676)	
633	Ectopic pregnancy	1
642	Hypertension complicating pregnancy, childbirth and the puerperium	3
669	Other complications of labor and delivery, not elsewhere classified	1
673	Obstetrical pulmonary embolism	2
	XII. DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE (680-709)	
682	Other cellulitis and abscess	10
686	Other local infections of skin and subcutaneous tissue	3
692	Contact dermatitis and other eczema	2
693	Dermatitis due to substances taken internally	1
694	Bullous dermatoses	1
695	Erythematous conditions	6
696	Psoriasis and similar disorders	1
707	Chronic ulcer of skin	79
	XIII. DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE (710-739)	
710	Diffuse diseases of connective tissue	82
711	Arthropathy associated with infections	1
714	Rheumatoid arthritis and other inflammatory polyarthropathies	66
715	Osteoarthrosis and allied disorders	18
716	Other and unspecified arthropathies	3
719	Other and unspecified disorder of joint	1
720	Ankylosing spondylitis and other inflammatory spondylopathies	1
721	Spondylosis and allied disorders	5
722	Intervertebral disc disorders	1
724	Other and unspecified disorders of back	1
728	Disorders of muscle, ligament and fascia	2
729	Other disorders of soft tissues	5
730	Osteomyelitis, periostitis and other infections involving bone	8
731	Osteitis deformans and osteopathies associated with other disorders classified elsewhere	1
732	Osteochondropathies	1
733	Other disorders of bone and cartilage	12
737	Curvature of spine	7
	XIV. CONGENITAL ANOMALIES (740-759)	
740	Anencephalus and similar anomalies	30
741	Spina bifida	13
742	Other congenital anomalies of nervous system	46
744	Congenital anomalies of ear, face and neck	1
745	Bulbus cordis anomalies and anomalies of cardiac septal closure	43
746	Other congenital anomalies of heart	130
747	Other congenital anomalies of circulatory system	44
748	Congenital anomalies of respiratory system	26
750	Other congenital anomalies of upper alimentary tract	1
751	Other congenital anomalies of digestive system	9
752	Congenital anomalies of genital organs	1
753	Congenital anomalies of urinary system	37
755	Other congenital anomalies of limbs	3
756	Other congenital musculoskeletal anomalies	23
757	Congenital anomalies of the integument	2
758	Chromosomal anomalies	37
759	Other and unspecified congenital anomalies	55
	XV. CERTAIN CONDITIONS ORIGINATING IN THE PERINATAL PERIOD (760-779)	
760	Fetus or newborn affected by maternal conditions which may be unrelated to present pregnancy	4
761	Fetus or newborn affected by maternal complications of pregnancy	89
762	Fetus or newborn affected by complications of placenta, cord and membranes	39
763	Fetus or newborn affected by other complications of labor and delivery	7
764	Slow fetal growth and fetal malnutrition	5
765	Disorders relating to short gestation and unspecified low birthweight	168
767	Birth trauma	30
768	Intrauterine hypoxia and birth asphyxia	76
769	Respiratory distress syndrome	193
770	Other respiratory conditions of fetus and newborn	177
771	Infections specific to the perinatal period	30
772	Fetal and neonatal hemorrhage	25
773	Hemolytic disease of fetus or newborn, due to isoimmunization	1
774	Other perinatal jaundice	1
775	Endocrine and metabolic disturbances specific to the fetus and newborn	3
776	Hematological disorders of fetus and newborn	9
777	Perinatal disorders of digestive system	21
778	Conditions involving the integument and temperature regulation of fetus and newborn	7
779	Other and ill-defined conditions originating in the perinatal period	165
	XVI. SYMPTOMS, SIGNS AND ILL-DEFINED CONDITIONS (780-799)	
780	General symptoms	11
783	Symptoms concerning nutrition, metabolism and development	[illegible]
785	Symptoms involving cardiovascular system	[illegible]
786	Symptoms involving respiratory system and other chest symptoms	[illegible]
789	Other symptoms involving abdomen and pelvis	[illegible]
796	Other nonspecific abnormal findings	[illegible]
797	Senility without mention of psychosis	[illegible]
798	Sudden death, cause unknown	[illegible]
799	Other ill-defined and unknown causes of morbidity and mortality	[illegible]
	XVII. EXTERNAL CAUSES OF INJURY AND POISONING (E800-E999)	
E805	Hit by rolling stock	5
E810	Motor vehicle traffic accident involving collision with train	[illegible]
E811	Motor vehicle traffic accident involving re-entrant collision with another motor vehicle	1
E812	Other motor vehicle traffic accident involving collision with another motor vehicle	681
E813	Motor vehicle traffic accident involving collision with other vehicle	40
E814	Motor vehicle traffic accident involving collision with pedestrian	285
E815	Other motor vehicle traffic accident involving collision on the highway	208
E816	Motor vehicle traffic accident due to loss of control, without collision on the highway	296
E817	Noncollision motor vehicle traffic accident while boarding or alighting	1
E818	Other noncollision motor vehicle traffic accident	28
E819	Motor vehicle traffic accident of unspecified nature	106
E820	Nontraffic accident involving motor-driven snow vehicle	13
E822	Other motor vehicle nontraffic accident involving collision with moving object	21
E823	Other motor vehicle nontraffic accident involving collision with stationary object	3
E825	Other motor vehicle nontraffic accident of other and unspecified nature	14
E826	Pedal cycle accident	3
E827	Animal-drawn vehicle accident	1
E828	Accident involving animal being ridden	1
E830	Accident to watercraft causing submersion	[illegible]
E831	Accident to watercraft causing other injury	[illegible]
E832	Other accidental submersion or drowning in water transport accident	10
E838	Other and unspecified water transport accident	2
E840	Accident to powered aircraft at takeoff or landing	5
E841	Accident to powered aircraft, other and unspecified	39
E842	Accident to unpowered aircraft	1
E844	Other specified air transport accidents	2
E850	Accidental poisoning by analgesics, antipyretics, antirheumatics	6
E851	Accidental poisoning by barbiturates	1
E852	Accidental poisoning by other sedatives and hypnotics	1
E853	Accidental poisoning by tranquillizers	4
E854	Accidental poisoning by other psychotropic agents	3
E855	Accidental poisoning by other drugs acting on central and autonomic nervous systems	4
E856	Accidental poisoning by antibiotics	3
E858	Accidental poisoning by other drugs	69
E860	Accidental poisoning by alcohol, not elsewhere classified	4
E866	Accidental poisoning by other and unspecified solid and liquid substances	5
E867	Accidental poisoning by gas distributed by pipeline	3
E868	Accidental poisoning by other utility gas and other carbon monoxide	63
E869	Accidental poisoning by other gases and vapors	3
E870	Accidental cut, puncture, perforation or hemorrhage during medical care	3
E873	Failure in dosage	1
E876	Other and unspecified misadventures during medical care	2
E878	Surgical operation and other surgical procedures as the cause of abnormal reaction of patient, or of later complication, without mention of misadventure at the time of operation	26
E879	Other procedures, without mention of misadventure at the time of procedure, as the cause of abnormal reaction of patient, or of later complication	7
E880	Fall on or from stairs or steps	60
E881	Fall on or from ladders or scaffolding	13
E882	Fall from or out of building or other structure	21
E883	Fall into hole or other opening in surface	6
E884	Other fall from one level to another	19
E885	Fall on same level from slipping, tripping or stumbling	9
E887	Fracture, cause unspecified	156
E888	Other and unspecified fall	186
E890	Conflagration in private dwelling	201
E891	Conflagration in other and unspecified building or structure	8
E892	Conflagration not in building or structure	6
E893	Accident caused by ignition of clothing	7
E894	Ignition of highly inflammable material	4
E895	Accident caused by controlled fire in private dwelling	[illegible]
E897	Accident caused by controlled fire not in building or structure	[illegible]
E898	Accident caused by other specified fire and flames	10
E899	Accident caused by unspecified fire	3
E900	Excessive heat	5

Table 4.16 Number of Deaths by Cause, Michigan Residents, 1981 (Continued)

ICD LIST NUMBER	CAUSE OF DEATH	NUMBER
E901	Excessive cold	35
E904	Hunger, thirst, exposure, neglect	13
E906	Other injury caused by animals	4
E937	Lightning	3
E908	Cataclysmic storms, and floods resulting from storms	1
E909	Cataclysmic earth surface movements and eruptions	1
E910	Accidental drowning and submersion	183
E911	Inhalation and ingestion of food causing obstruction of respiratory tract or suffocation	86
E912	Inhalation and ingestion of other object causing obstruction of respiratory tract or suffocation	43
E913	Accidental mechanical suffocation	37
E915	Foreign body accidentally entering other orifice	3
E916	Struck accidentally by falling object	33
E917	Striking against or struck accidentally by objects or persons	8
E918	Caught accidentally in or between objects	3
E919	Accidents caused by machinery	55
E920	Accidents caused by cutting and piercing instruments or objects	4
E921	Accident caused by explosion of pressure vessel	2
E922	Accident caused by firearm missile	51
E923	Accident caused by explosive material	6
E924	Accident caused by hot substance or object, caustic or corrosive material and steam	10
E925	Accident caused by electric current	29
E927	Overexertion and strenuous movements	1
E928	Other and unspecified environmental and accidental causes	31
E929	Late effects of accidental injury	16
E935	Analgesics, antipyretics and antirheumatics	1
E938	Other central nervous system depressants	1
E947	Other and unspecified drugs and medicaments	7
E950	Suicide and selfinflicted poisoning by solid or liquid substances	105
E951	Suicide and selfinflicted poisoning by gases in domestic use	3
E952	Suicide and selfinflicted poisoning by other gases and vapors	150
E953	Suicide and selfinflicted injury by hanging, strangulation and suffocation	160
E954	Suicide and selfinflicted injury by submersion [drowning]	26
E955	Suicide and selfinflicted injury by firearms and explosives	579
E956	Suicide and selfinflicted injury by cutting and piercing instruments	16
E957	Suicide and selfinflicted injuries by jumping from high place	16
E958	Suicide and selfinflicted injury by other and unspecified means	19
E960	Fight, brawl, rape	1
E963	Assault by hanging and strangulation	46
E964	Assault by submersion [drowning]	2
E965	Assault by firearms and explosives	582
E966	Assault by cutting and piercing instrument	166
E967	Child battering and other maltreatment	12
E968	Assault by other and unspecified means	118
E969	Late effects of injury purposely inflicted by other person	2
E970	Injury due to legal intervention by firearms	9
E980	Poisoning by solid or liquid substances, undetermined whether accidentally or purposely inflicted	34
E982	Poisoning by other gases, undetermined whether accidentally or pruposely inflicted	6
E983	Hanging, strangulation or suffocation, undetermined whether accidentally or purposely inflicted	2
E984	Submersion [drowning], undetermined whether accidentally or purposely inflicted	10
E985	Injury by firearms and explosives, undetermined whether accidentally or purposely inflicted	12
E987	Falling from high place, undetermined whether accidentally or purposely inflicted	2
E988	Injury by other and unspecified means, undetermined whether accidentally or purposely inflicted	23

Table 4.17
Population by Age, Race, and Sex, Michigan Residents, 1981

AGE IN YEARS	ALL RACES			WHITE			ALL OTHER		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Under 1	140697	71713	68984	112685	57649	55036	28012	14064	13948
1-4	554794	283777	271017	443869	227938	215931	110925	55839	55086
5-9	686687	351446	335241	541023	278247	262776	145664	73199	72465
10-14	774805	395925	378880	630464	323220	307244	144341	72705	71636
15-19	871572	440231	431341	731083	370562	360521	140489	69669	70820
20-24	894065	441042	453023	752341	374033	378308	141724	67009	74715
25-29	821339	406399	414940	686422	343988	342434	134917	62411	72506
30-34	751993	369604	382389	632495	314407	318088	119498	55197	64301
35-39	581466	285965	295501	498299	246758	251541	83167	39207	43960
40-44	475747	232165	243582	411714	202614	209100	64033	29551	34482
45-49	436977	211672	225305	378313	184993	193320	58664	26679	31985
50-54	473650	230478	243172	413865	202696	211169	59785	27782	32003
55-59	472285	226413	245872	416095	199640	216455	56190	26773	29417
60-64	401153	187820	213333	356509	167210	189299	44644	20610	24034
65-69	325271	147088	178183	288663	130735	157928	36608	16353	20255
70-74	240812	102128	138684	215733	91131	124602	25079	10997	14082
75-79	171487	67463	104024	154492	60316	94176	16995	7147	9848
80-84	110367	39070	71297	101071	35398	65673	9296	3672	5624
85+	84833	26293	58540	78398	24153	54245	6435	2140	4295
Total	9270000	4516692	4753308	7843534	3835688	4007846	1426466	681004	745462

Source: Estimates by age and sex were provided by the Department of Management and Budget, Office of the Budget. The breakdowns of the age-sex estimates by race were prepared by the Department of Public Health, Office of Vital and Health Statistics. See Technical Notes.

Table 4.18
Population Changes by County, Michigan Residents, 1971-1981

AREA	POPULATION ESTIMATE JULY 1, 1971	POPULATION ESTIMATE JULY 1, 1981	NET CHANGE	PERCENT CHANGE	NATURAL INCREASE	ESTIMATED NET MIGRATION
State	8,972,000	9,270,000	298,000	3.3	650,286	-352,286
Alcona	7,600	9,903	2,303	30.3	-137	2,440
Alger	8,400	9,105	705	8.4	286	419
Allegan	68,700	82,600	13,900	20.2	6,384	7,516
Alpena	31,500	32,649	1,149	3.6	2,121	-972
Antrim	13,300	16,604	3,304	24.8	648	2,656
Arenac	11,700	14,928	3,228	27.6	585	2,643
Baraga	7,700	8,616	916	11.9	284	632
Barry	39,100	46,853	7,753	19.8	2,863	4,890
Bay	118,500	119,457	957	0.8	9,068	-8,111
Benzie	8,600	11,445	2,845	33.1	217	2,628
Berrien	165,200	170,167	4,967	3.0	13,220	-8,253
Branch	38,800	40,216	1,416	3.6	2,367	-951
Calhoun	140,600	141,363	763	0.5	9,239	-8,476
Cass	43,600	49,267	5,667	13.0	2,961	2,706
Charlevoix	17,100	19,883	2,783	16.3	1,126	1,657
Cheboygan	17,200	20,847	3,647	21.2	1,071	2,576
Chippewa	33,300	29,317	-3,983	-12.0	3,069	-7,052
Clare	17,500	24,377	6,877	39.3	538	6,339
Clinton	48,800	55,950	7,150	14.7	5,001	2,149
Crawford	6,700	9,617	2,917	43.5	503	2,414
Delta	36,700	39,247	2,547	6.9	1,929	618
Dickinson	23,900	25,380	1,480	6.2	313	1,167
Eaton	70,800	88,389	17,589	24.8	6,300	11,289
Emmet	19,300	23,703	4,403	22.8	1,111	3,292
Genesee	448,300	450,861	2,561	0.6	42,982	-40,421
Gladwin	14,100	20,321	6,221	44.1	674	5,547
Gogebic	20,600	19,813	-787	-3.8	-663	-124
Gd. Traverse	40,800	56,736	15,936	39.1	3,637	12,299
Gratiot	39,900	40,708	808	2.0	2,933	-2,125
Hillsdale	38,300	41,650	3,350	8.7	2,508	842
Houghton	35,900	38,059	2,159	6.0	359	1,800
Huron	35,200	36,680	1,480	4.2	1,515	-35
Ingham	264,100	277,956	13,856	5.2	26,973	-13,117
Ionia	47,000	52,362	5,362	11.4	4,285	1,077
Iosco	26,300	29,106	2,806	10.7	2,826	-20
Iron	13,600	13,721	121	0.9	-495	616
Isabella	46,800	54,084	7,284	15.6	4,051	3,233
Jackson	143,600	149,799	6,199	4.3	9,423	-3,224
Kalamazoo	201,600	215,876	14,276	7.1	15,821	-1,545
Kalkaska	5,600	11,296	5,696	101.7	752	4,944
Kent	411,700	451,572	39,872	9.7	37,481	2,391
Keweenaw	2,400	1,969	-431	-18.0	-90	-341
Lake	6,300	7,821	1,521	24.1	-132	1,653
Lapeer	54,200	70,299	16,099	29.7	6,171	9,928

Table 4.18 (Continued)

AREA	POPULATION ESTIMATE JULY 1, 1971	POPULATION ESTIMATE JULY 1, 1981	NET CHANGE	PERCENT CHANGE	NATURAL INCREASE	ESTIMATED NET MIGRATION
Leelanau	10,900	13,783	2,883	26.4	438	2,445
Lenawee	82,900	90,132	7,232	8.7	7,093	139
Livingston	61,400	101,196	39,796	64.8	6,911	32,885
Luce	7,200	6,453	-747	-10.4	320	-1,067
Mackinac	10,000	10,262	262	2.6	320	-58
Macomb	634,200	693,698	59,498	9.4	51,736	7,762
Manistee	21,100	22,807	1,707	8.1	263	1,444
Marquette	66,800	74,140	7,340	11.0	7,588	-248
Mason	23,900	26,872	2,972	12.4	988	1,984
Mecosta	29,200	37,783	8,583	29.4	2,164	6,419
Menominee	24,900	26,071	1,171	4.7	548	623
Midland	65,100	73,373	8,273	12.7	6,973	1,300
Missaukee	7,900	10,198	2,298	29.1	678	1,620
Monroe	121,600	133,367	11,767	9.7	10,912	855
Montcalm	40,600	49,387	8,787	21.6	3,179	5,608
Montmorency	5,400	7,597	2,197	40.7	144	2,053
Muskegon	158,300	157,913	-387	-0.2	11,689	-12,076
Newaygo	28,400	35,601	7,201	25.4	1,938	5,263
Oakland	915,900	1,013,274	97,374	10.6	67,460	29,914
Oceana	18,700	22,142	3,442	18.4	1,441	2,001
Ogemaw	12,200	16,386	4,186	34.3	322	3,864
Ontonagon	10,800	10,086	-714	-6.6	321	-1,035
Osceola	15,900	19,191	3,291	20.7	1,077	2,214
Oscoda	4,900	7,125	2,225	45.4	6	2,219
Otsego	10,900	15,072	4,172	38.3	1,145	3,027
Ottawa	129,400	159,735	30,335	23.4	14,626	15,709
Presque Isle	13,100	14,111	1,011	7.7	706	305
Roscommon	10,800	17,339	6,539	60.5	-110	6,649
Saginaw	223,200	227,384	4,184	1.9	20,726	-16,542
St. Clair	125,100	139,292	14,192	11.3	8,287	5,905
St. Joseph	48,300	57,922	9,622	19.9	3,988	5,634
Sanilac	36,100	40,964	4,864	13.5	1,951	2,913
Schoolcraft	8,300	8,339	39	0.5	199	-160
Shiawassee	65,100	70,997	5,897	9.1	6,451	-554
Tuscola	49,800	56,937	7,137	14.3	4,310	2,827
Van Buren	58,200	67,408	9,208	15.8	4,550	4,658
Washtenaw	236,200	266,996	30,796	13.0	23,937	6,859
Wayne	2,669,000	2,312,415	-356,585	-13.4	141,630	-498,215
Wexford	20,300	25,697	5,397	26.6	1,378	4,019
Co. Not Stated	-	-	-	-	-75	75

Table 4.19
Abridged Life Table, Michigan Residents, 1981

AGE	nqx(1)[1]	1x(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	e̊x(6)[1]
0-1	0.01316	100000	1316	98825	7355375	73.6
1-5	0.00223	98684	220	394212	7256550	73.5
5-10	0.00137	98465	134	491955	6862337	69 7
10-15	0.00160	98331	157	491309	6370382	64.8
15-20	0.00366	98174	359	490047	5879073	59.9
20-25	0.00519	97815	507	487856	5389027	55.1
25-30	0.00602	97308	585	485113	4901170	50.4
30-35	0.00698	96723	674	481994	4416057	45.7
35-40	0.00935	96049	898	478121	3934063	41.0
40-45	0.01329	95151	1264	472827	3455942	36.3
45-50	0.02159	93886	2026	464761	2983114	31.8
50-55	0.03443	91860	3162	451947	2518353	27.4
55-60	0.05276	88698	4679	432525	2066406	23.3
60-65	0.07963	84018	6690	404323	1633882	19.4
65-70	0.11994	77328	9274	364508	1229558	15.9
70-75	0.17250	68054	11739	311984	865051	12.7
75-80	0.25506	56315	14363	246266	553067	9.8
80-85	0.34825	41952	14610	172822	306800	7.3
85+	1.00000	27342	27342	133978	133978	4.9

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.20
Abridged Life Table for Males, Michigan Residents, 1981

AGE	nqx(1)[1]	1x(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	e̊x(6)[1]
0-1	0.01450	100000	1450	98709	7020641	70.2
1-5	0.00252	98550	248	393604	6921932	70.2
5-10	0.00154	98301	151	491091	6528328	66.4
10-15	0.00191	98150	187	490361	6037236	61.5
15-20	0.00530	97963	518	488640	5546876	56.6
20-25	0.00783	97445	763	485389	5058236	51.9
25-30	0.00894	96682	863	481281	4572847	47.3
30-35	0.00943	95819	903	476896	4091566	42.7
35-40	0.01221	94915	1158	471829	3614670	38.1
40-45	0.01725	93757	1617	465027	3142841	33.5
45-50	0.02739	92140	2523	454873	2677814	29.1
50-55	0.04379	89617	3924	438975	2222940	24.8
55-60	0.06869	85693	5885	414670	1783966	20.8
60-65	0.10444	79807	8335	379349	1369296	17.2
65-70	0.15948	71473	11398	329978	989947	13.9
70-75	0.22740	60075	13661	267024	659969	11.0
75-80	0.32862	46414	15252	193894	392945	8.5
80-85	0.43143	31162	13444	121092	199051	6.4
85+	1.00000	17718	17718	77959	77959	4.4

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.21
Abridged Life Table for Females, Michigan Residents, 1981

AGE	nqx(1)[1]	1x(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	e̊x(6)[1]
0-1	0.01176	100000	1176	98948	7687905	76.9
1-5	0.00192	98824	189	394845	7588958	76.8
5-10	0.00118	98635	116	492855	7194112	72.9
10-15	0.00127	98519	125	492298	6701257	68.0
15-20	0.00199	98394	195	491510	6208959	63.1
20-25	0.00261	98199	255	490381	5717448	58.2
25-30	0.00316	97944	309	488987	5227067	53.4
30-35	0.00460	97635	448	487123	4738081	48.5
35-40	0.00658	97187	639	484432	4250958	43.7
40-45	0.00951	96547	918	480630	3766526	39.0
45-50	0.01611	95630	1540	474607	3285896	34.4
50-55	0.02548	94090	2397	464858	2811290	29.9
55-60	0.03788	91692	3473	450333	2346432	25.6
60-65	0.05728	88220	5052	429234	1896098	21.5
65-70	0.08602	83167	7154	398955	1466864	17.6
70-75	0.12981	76013	9867	356714	1067909	14.0
75-80	0.20354	66146	13463	298290	711195	10.8
80-85	0.29815	52683	15707	224328	412905	7.8
85+	1.00000	36976	36976	188577	188577	5.1

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.22
Abridged Life Table for Whites, Michigan Residents, 1981

AGE	nqx(1)[1]	1x(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	e̊x(6)[1]
0-1	0.01126	100000	1126	99001	7427583	74.3
1-5	0.00208	98874	205	395010	7328582	74.1
5-10	0.00132	98669	129	492989	6933571	70.3
10-15	0.00156	98540	153	492365	6440582	65.4
15-20	0.00371	98387	365	491087	5948218	60.5
20-25	0.00479	98022	469	488958	5457131	55.7
25-30	0.00486	97552	474	486585	4968172	50.9
30-35	0.00514	97079	498	484206	4481588	46.2
35-40	0.00776	96581	749	481157	3997382	41.4
40-45	0.01159	95831	1110	476611	3516225	36.7
45-50	0.01961	94721	1857	469341	3039614	32.1
50-55	0.03163	92864	2936	457513	2570273	27.7
55-60	0.04927	89927	4430	439302	2112760	23.5
60-65	0.07601	85497	6498	412242	1673459	19.6
65-70	0.11706	78999	9247	372993	1261217	16.0
70-75	0.17011	69751	11865	320252	888224	12.7
75-80	0.25577	57886	14805	253077	567972	9.8
80-85	0.34873	43081	15023	177413	314896	7.3
85+	1.00000	28058	28058	137483	137483	4.9

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.23
Abridged Life Table for White Males, Michigan Residents, 1981

AGE	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.01251	100000	1251	98891	7099064	71.0
1-5	0.00242	98749	239	394430	7000174	70.9
5-10	0.00153	98510	150	492138	6605743	67.1
10-15	0.00191	98360	187	491410	6113605	62.2
15-20	0.00534	98173	523	489664	5622195	57.3
20-25	0.00721	97650	704	486524	5132531	52.6
25-30	0.00716	96946	694	482990	4646007	47.9
30-35	0.00707	96252	680	479615	4163018	43.3
35-40	0.01005	95572	960	475610	3683403	38.5
40-45	0.01491	94612	1410	469809	3207793	33.9
45-50	0.02451	93202	2284	460765	2737984	29.4
50-55	0.04022	90917	3656	446147	2277219	25.0
55-60	0.06479	87261	5653	423115	1831072	21.0
60-65	0.10036	81608	8190	388772	1407956	17.3
65-70	0.15605	73418	11457	339662	1019184	13.9
70-75	0.22637	61961	14026	275668	679522	11.0
75-80	0.33188	47935	15909	199878	403854	8.4
80-85	0.43393	32027	13897	124206	203976	6.4
85+	1.00000	18130	18130	79770	79770	4.4

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.24
Abridged Life Table for White Females, Michigan Residents, 1981

AGE	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	ex(6)[1]
0-1	0.00996	100000	996	99118	7752738	77.5
1-5	0.00171	99004	169	395618	7653621	77.3
5-10	0.00109	98836	107	493884	7258002	73.4
10-15	0.00119	98729	117	493369	6764118	68.5
15-20	0.00204	98611	201	492579	6270749	63.6
20-25	0.00239	98410	235	491475	5778170	58.7
25-30	0.00254	98175	249	490270	5286695	53.8
30-35	0.00322	97926	315	488903	4796425	49.0
35-40	0.00552	97611	538	486814	4307521	44.1
40-45	0.00837	97073	812	483523	3820708	39.4
45-50	0.01490	96261	1434	478013	3337185	34.7
50-55	0.02331	94827	2210	468983	2859172	30.2
55-60	0.03475	92617	3218	455586	2390189	25.8
60-65	0.05400	89399	4827	435729	1934603	21.6
65-70	0.08356	84572	7066	406233	1498873	17.7
70-75	0.12663	77506	9815	364383	1092640	14.1
75-80	0.20300	67691	13741	305410	728257	10.8
80-85	0.29815	53950	16085	229734	422847	7.8
85+	1.00000	37865	37865	193113	193113	5.1

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.25
Abridged Life Table for All Other, Michigan Residents, 1981

AGE	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	e̊x(6)[1]
0-1	0.02078	100000	2078	98121	6953767	69.5
1-5	0.00285	97922	278	391004	6855646	70.0
5-10	0.00155	97644	151	487804	6464642	66.2
10-15	0.00177	97493	172	487071	5976838	61.3
15-20	0.00338	97321	329	485894	5489767	56.4
20-25	0.00728	96992	706	483366	5003873	51.6
25-30	0.01191	96286	1146	478748	4520507	46.9
30-35	0.01665	95140	1584	471868	4041759	42.5
35-40	0.01883	93556	1761	463510	3569891	38.2
40-45	0.02417	91795	2218	453701	3106381	33.8
45-50	0.03423	89577	3065	440726	2652679	29.6
50-55	0.05365	86511	4641	421650	2211953	25.6
55-60	0.07822	81870	6404	394074	1790303	21.9
60-65	0.10807	75467	8155	357606	1396229	18.5
65-70	0.14226	67311	9576	313237	1038623	15.4
70-75	0.19274	57736	11128	261278	725386	12.6
75-80	0.24861	46608	11587	204256	464108	10.0
80-85	0.34297	35021	12011	144801	259851	7.4
85+	1.00000	23010	23010	115051	115051	5.0

[1] Definitions of life table values are contained in the Technical Notes.

Table 4.26
Abridged Life Table for Other Males, Michigan Residents, 1981

AGE	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	e̊x(6)[1]
0-1	0.02269	100000	2269	97965	6575148	65.8
1-5	0.00294	97731	287	390219	6477183	66.3
5-10	0.00157	97445	153	486803	6086964	62.5
10-15	0.00193	97292	187	486062	5600160	57.6
15-20	0.00509	97105	494	484477	5114098	52.7
20-25	0.01129	96611	1090	480597	4629622	47.9
25-30	0.01867	95520	1783	473363	4149025	43.4
30-35	0.02276	93738	2133	463475	3675662	39.2
35-40	0.02570	91605	2354	452310	3212187	35.1
40-45	0.03315	89251	2958	439215	2759877	30.9
45-50	0.04711	86293	4065	421875	2320662	26.9
50-55	0.06946	82228	5711	397566	1898787	23.1
55-60	0.09724	76517	7440	364765	1501221	19.6
60-65	0.13686	69077	9453	322516	1136456	16.5
65-70	0.18637	59624	11112	270754	813940	13.7
70-75	0.23587	48512	11442	213961	543186	11.2
75-80	0.30051	37070	11140	157313	329226	8.9
80-85	0.40658	25930	10543	102669	171913	6.6
85+	1.00000	15388	15388	69244	69244	4.5

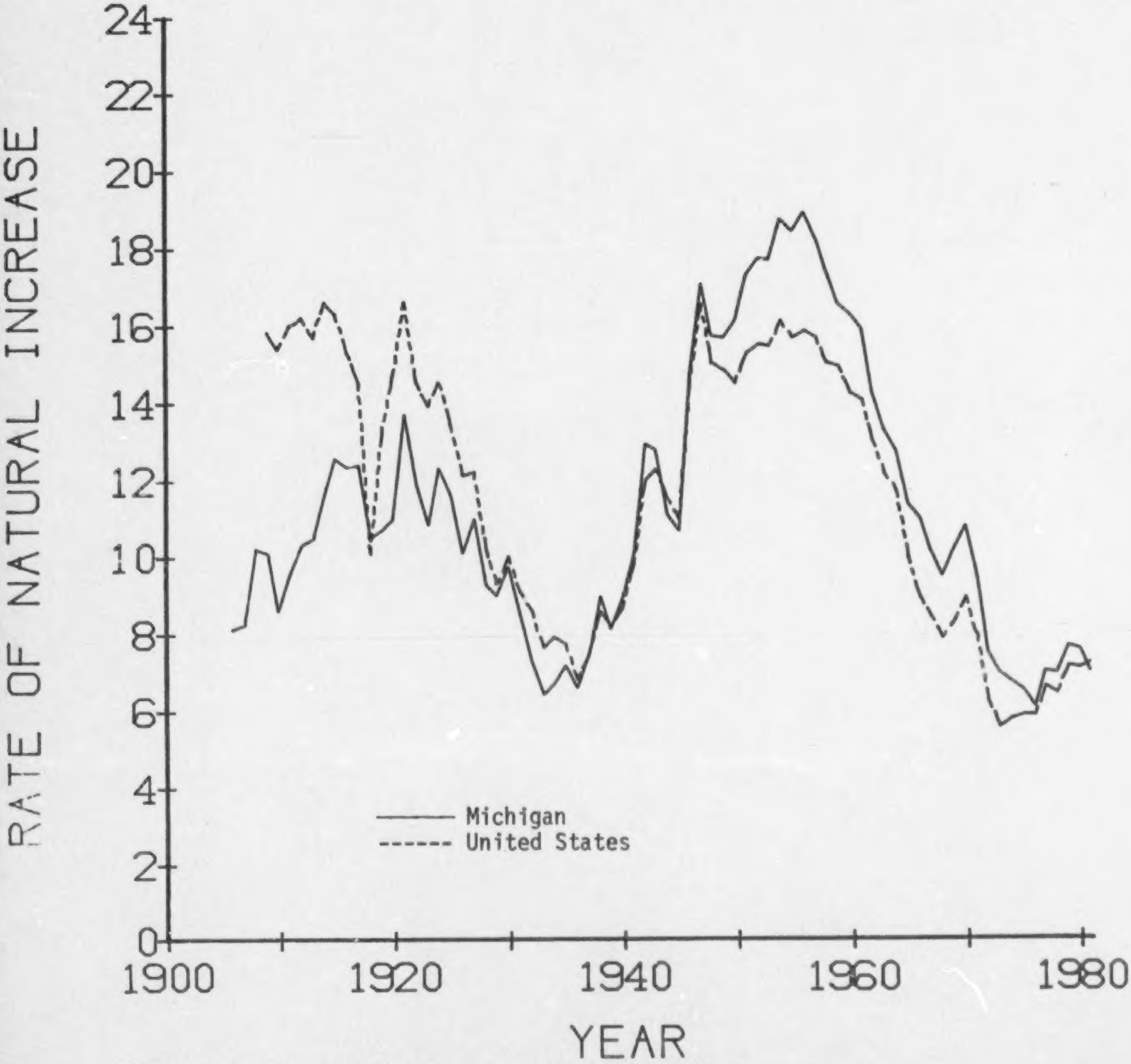
[1] Definitions of life table values are contained in the Technical Notes

Table 4.27
Abridged Life Table for Other Females, Michigan Residents, 1981

AGE	nqx(1)[1]	lx(2)[1]	ndx(3)[1]	nLx(4)[1]	Tx(5)[1]	e̊x(6)[1]
0-1	0.01886	100000	1886	98279	7336273	73.4
1-5	0.00276	98114	270	391795	7237993	73.8
5-10	0.00152	97844	148	488813	6846198	70.0
10-15	0.00161	97696	157	488090	6357385	65.1
15-20	0.00170	97539	165	487324	5869295	60.2
20-25	0.00368	97374	358	486063	5381971	55.3
25-30	0.00606	97016	587	483766	4895908	50.5
30-35	0.01137	96429	1096	479533	4412141	45.8
35-40	0.01267	95333	1207	473739	3932608	41.3
40-45	0.01641	94126	1544	466968	3458869	36.7
45-50	0.02336	92582	2162	457931	2991901	32.3
50-55	0.03972	90420	3591	443767	2533970	28.0
55-60	0.06059	86829	5260	421649	2090203	24.1
60-65	0.08269	81568	6744	391522	1668554	20.5
65-70	0.10502	74824	7858	355267	1277033	17.1
70-75	0.15744	66966	10543	309291	921766	13.8
75-80	0.20875	56424	11778	253251	612475	10.9
80-85	0.29819	44646	13313	190024	359224	8.0
85+	1.00000	31333	31333	169200	169200	5.4

[1] Definitions of life table values are contained in the Technical Notes.

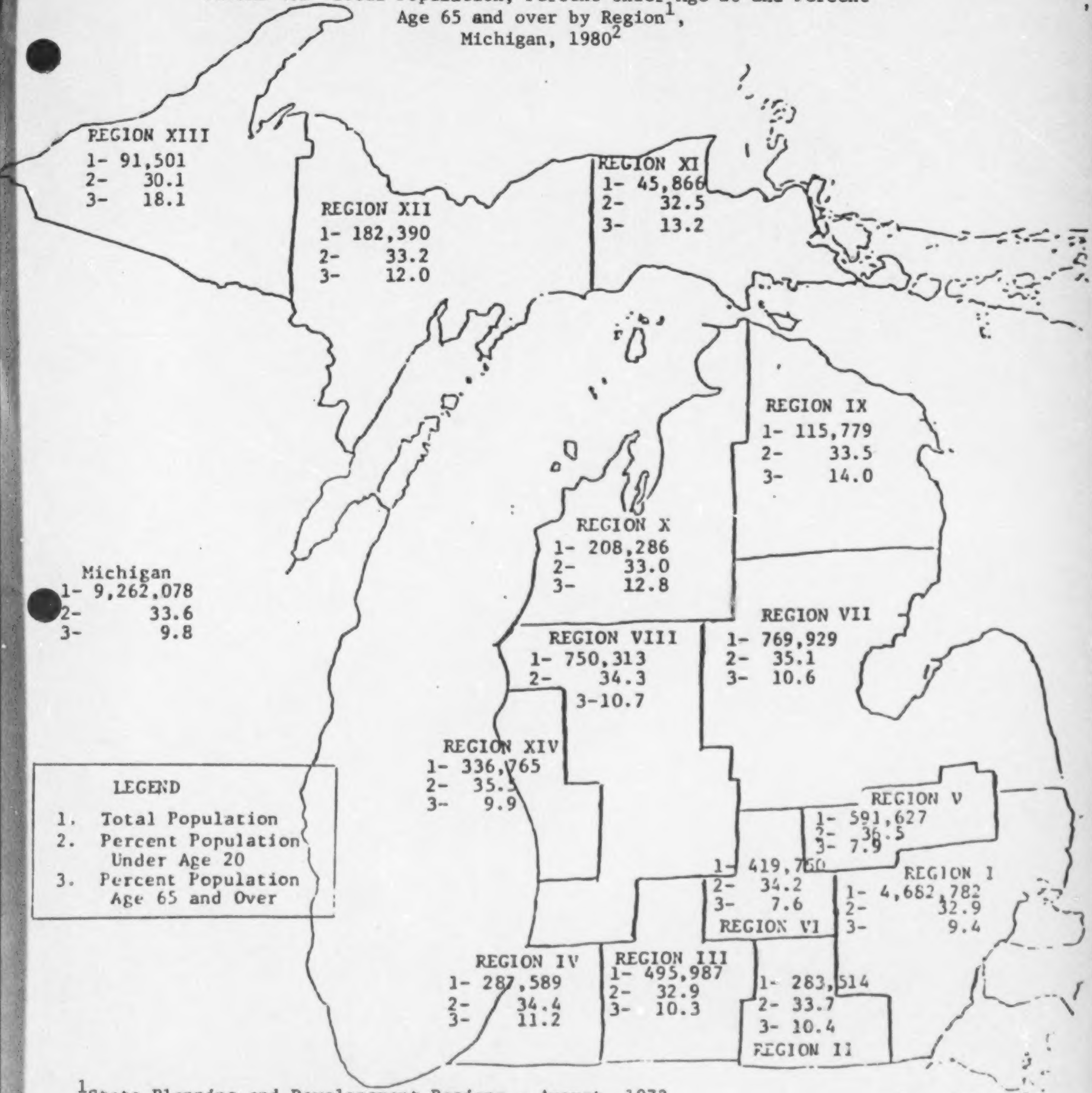
FIGURE 4.1 RATE OF NATURAL INCREASE[1], MICHIGAN 1906-1981, AND THE UNITED STATES, 1909-1981[2]



[1] Excess of live births over deaths per 1,000 population.

[2] Rates for the United States for 1909-1932 are based on death rates for the death-registration states and estimated birth rates for the United States, adjusted for under-registration. For 1933-1959 rates are based on registered deaths in the United States and births adjusted for underregistration. After 1959 rates are based on registered births and deaths. The rates for 1979, 1980, and 1981 are provisional.

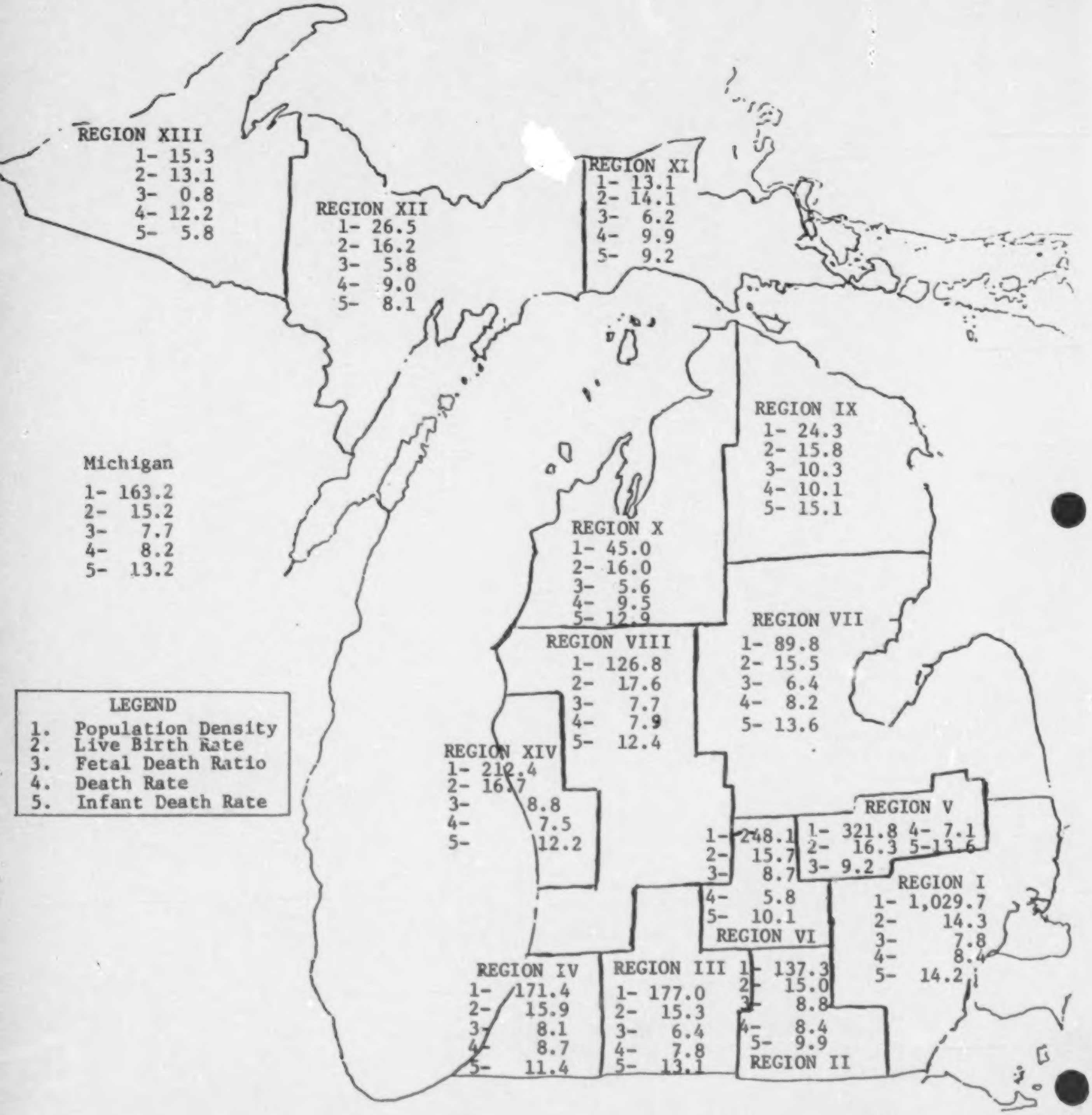
FIGURE 4.2 Total Population, Percent Under Age 20 and Percent Age 65 and over by Region[1], Michigan, 1980[2]


REGION XIII
1- 91,501
2- 30.1
3- 18.1
REGION XII
1- 182,390
2- 33.2
3- 12.0
REGION XI
1- 45,866
2- 32.5
3- 13.2
REGION IX
1- 115,779
2- 33.5
3- 14.0
REGION X
1- 208,286
2- 33.0
3- 12.8
Michigan
1- 9,262,078
2- 33.6
3- 9.8
REGION VII
1- 769,929
2- 35.1
3- 10.6
REGION VIII
1- 750,313
2- 34.3
3-10.7
REGION XIV
1- 336,765
2- 35.5
3- 9.9
LEGEND
1. Total Population
2. Percent Population Under Age 20
3. Percent Population Age 65 and Over
REGION V
1- 591,627
2- 36.5
3- 7.9
1- 419,760
2- 34.2
3- 7.6
REGION VI
REGION I
1- 4,682,782
2- 32.9
3- 9.4
REGION IV
1- 287,589
2- 34.4
3- 11.2
REGION III
1- 495,987
2- 32.9
3- 10.3
1- 283,514
2- 33.7
3- 10.4
REGION II

[1] State Planning and Developement Regions - August, 1973

[2] Population for regions by age is not available for 1981.
1981 State population - Total: 9,270,000
Under age 20: 3,028,555 (32.7 percent)
Age 65 and over: 932,770 (10.1 percent)

FIGURE 4.3 Population Density[1], Live Birth Rates, Fetal Death Ratios, Death Rates and Infant Mortality Rates by Region[2], Michigan Residents, 1981

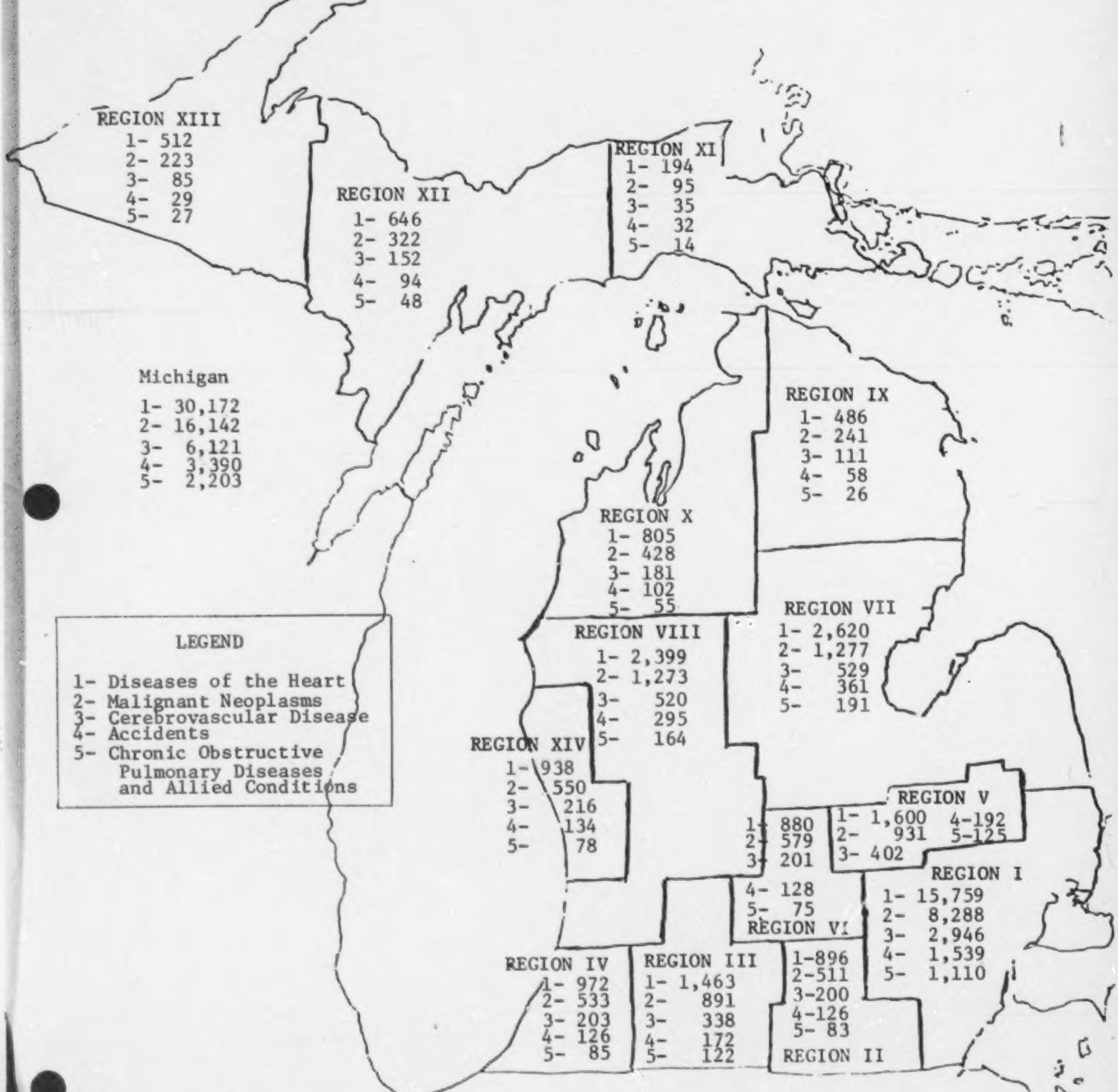

REGION XIII
1- 15.3
2- 13.1
3- 0.8
4- 12.2
5- 5.8
REGION XII
1- 26.5
2- 16.2
3- 5.8
4- 9.0
5- 8.1
REGION XI
1- 13.1
2- 14.1
3- 6.2
4- 9.9
5- 9.2
REGION IX
1- 24.3
2- 15.8
3- 10.3
4- 10.1
5- 15.1
Michigan
1- 163.2
2- 15.2
3- 7.7
4- 8.2
5- 13.2
REGION X
1- 45.0
2- 16.0
3- 5.6
4- 9.5
5- 12.9
REGION VII
1- 89.8
2- 15.5
3- 6.4
4- 8.2
5- 13.6
REGION VIII
1- 126.8
2- 17.6
3- 7.7
4- 7.9
5- 12.4
LEGEND
1. Population Density
2. Live Birth Rate
3. Fetal Death Ratio
4. Death Rate
5. Infant Death Rate
REGION XIV
1- 212.4
2- 16.7
3- 8.8
4- 7.5
5- 12.2
REGION V
1- 321.8 4- 7.1
2- 16.3 5- 13.6
3- 9.2
1- 248.1
2- 15.7
3- 8.7
4- 5.8
5- 10.1
REGION VI
REGION I
1- 1,029.7
2- 14.3
3- 7.8
4- 8.4
5- 14.2
REGION IV
1- 171.4
2- 15.9
3- 8.1
4- 8.7
5- 11.4
REGION III
1- 177.0
2- 15.3
3- 6.4
4- 7.8
5- 13.1
1- 137.3
2- 15.0
3- 8.8
4- 8.4
5- 9.9
REGION II

---

[1] Number of persons per square mile.

[2] State Planning and Developement Regions - August, 1973

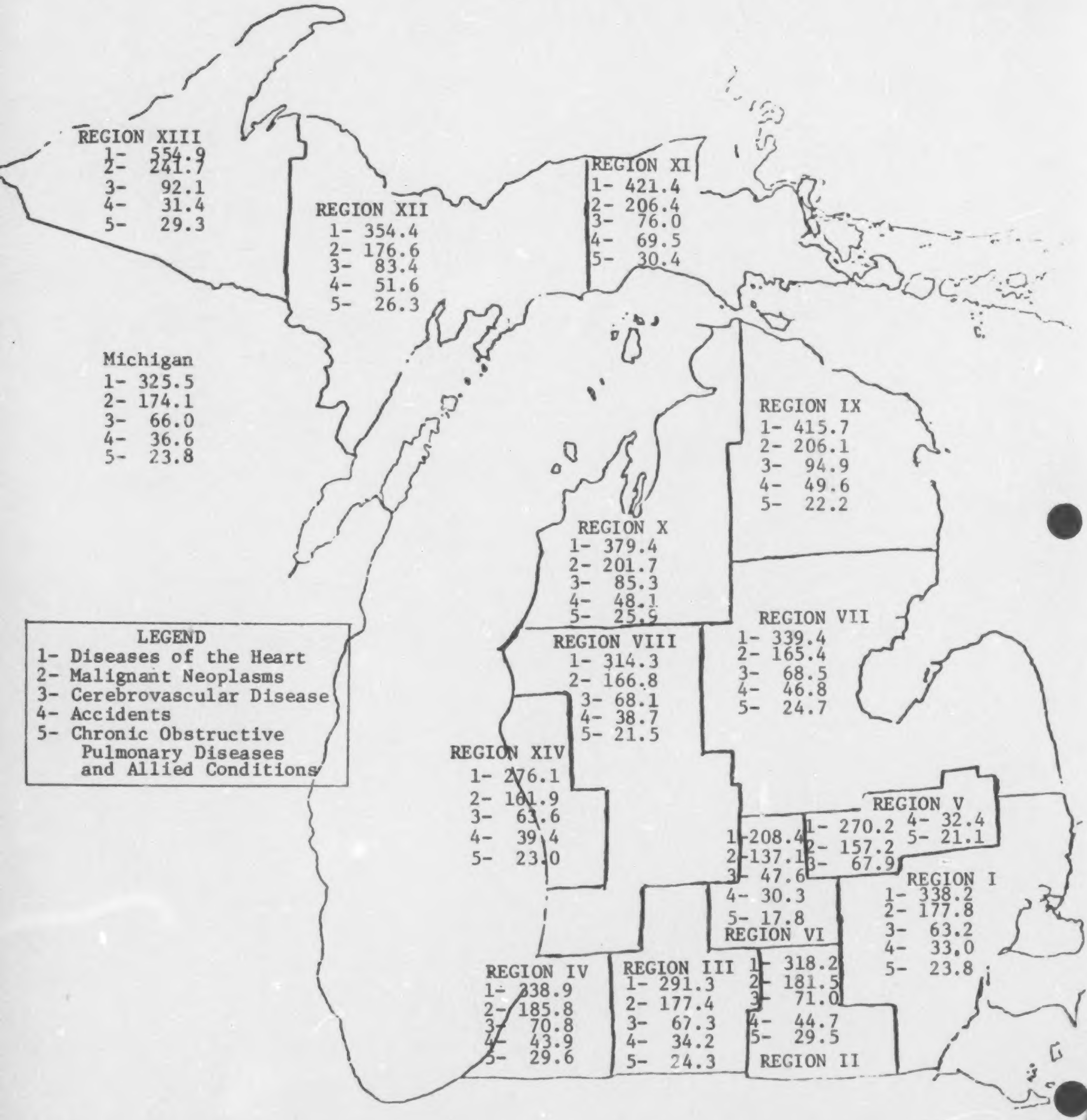
FIGURE 4.4 Leading Causes of Death: Number of Deaths by Region[1], Michigan Residents, 1981


REGION XIII
1- 512
2- 223
3- 85
4- 29
5- 27
REGION XII
1- 646
2- 322
3- 152
4- 94
5- 48
REGION XI
1- 194
2- 95
3- 35
4- 32
5- 14
Michigan
1- 30,172
2- 16,142
3- 6,121
4- 3,390
5- 2,203
REGION IX
1- 486
2- 241
3- 111
4- 58
5- 26
REGION X
1- 805
2- 428
3- 181
4- 102
5- 55
REGION VIII
1- 2,399
2- 1,273
3- 520
4- 295
5- 164
REGION VII
1- 2,620
2- 1,277
3- 529
4- 361
5- 191
LEGEND
1- Diseases of the Heart
2- Malignant Neoplasms
3- Cerebrovascular Disease
4- Accidents
5- Chronic Obstructive Pulmonary Diseases and Allied Conditions
REGION XIV
1- 938
2- 550
3- 216
4- 134
5- 78
1- 880
2- 579
3- 201
4- 128
5- 75
REGION VI
REGION V
1- 1,600
2- 931
3- 402
4-192
5-125
REGION I
1- 15,759
2- 8,288
3- 2,946
4- 1,539
5- 1,110
REGION IV
1- 972
2- 533
3- 203
4- 126
5- 85
REGION III
1- 1,463
2- 891
3- 338
4- 172
5- 122
1-896
2-511
3-200
4-126
5- 83
REGION II

---

[1] State Planning and Developement Regions - August, 1973

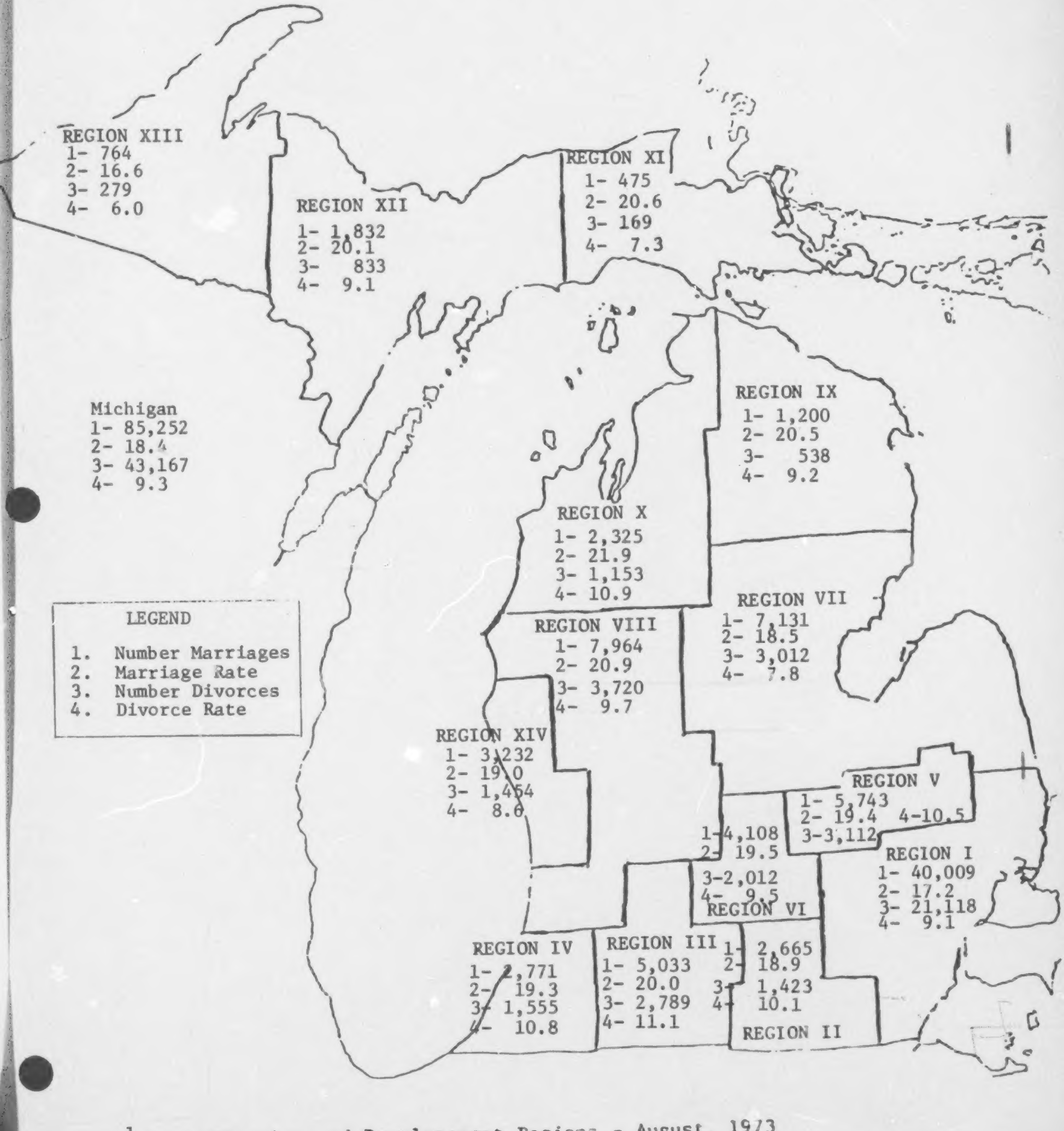
FIGURE 4.5 Leading Causes of Death: Death Rates by Region[1], Michigan Residents, 1981


REGION XIII
1- 554.9
2- 241.7
3- 92.1
4- 31.4
5- 29.3
REGION XII
1- 354.4
2- 176.6
3- 83.4
4- 51.6
5- 26.3
REGION XI
1- 421.4
2- 206.4
3- 76.0
4- 69.5
5- 30.4
Michigan
1- 325.5
2- 174.1
3- 66.0
4- 36.6
5- 23.8
REGION IX
1- 415.7
2- 206.1
3- 94.9
4- 49.6
5- 22.2
REGION X
1- 379.4
2- 201.7
3- 85.3
4- 48.1
5- 25.9
REGION VII
1- 339.4
2- 165.4
3- 68.5
4- 46.8
5- 24.7
REGION VIII
1- 314.3
2- 166.8
3- 68.1
4- 38.7
5- 21.5
LEGEND
1- Diseases of the Heart
2- Malignant Neoplasms
3- Cerebrovascular Disease
4- Accidents
5- Chronic Obstructive Pulmonary Diseases and Allied Conditions
REGION XIV
1- 276.1
2- 161.9
3- 63.6
4- 39.4
5- 23.0
REGION V
1- 270.2
2- 157.2
3- 67.9
4- 32.4
5- 21.1
1- 208.4
2- 137.1
3- 47.6
4- 30.3
5- 17.8
REGION VI
REGION I
1- 338.2
2- 177.8
3- 63.2
4- 33.0
5- 23.8
REGION IV
1- 338.9
2- 185.8
3- 70.8
4- 43.9
5- 29.6
REGION III
1- 291.3
2- 177.4
3- 67.3
4- 34.2
5- 24.3
1- 318.2
2- 181.5
3- 71.0
4- 44.7
5- 29.5
REGION II

---

[1] State Planning and Developement Regions - August, 1973

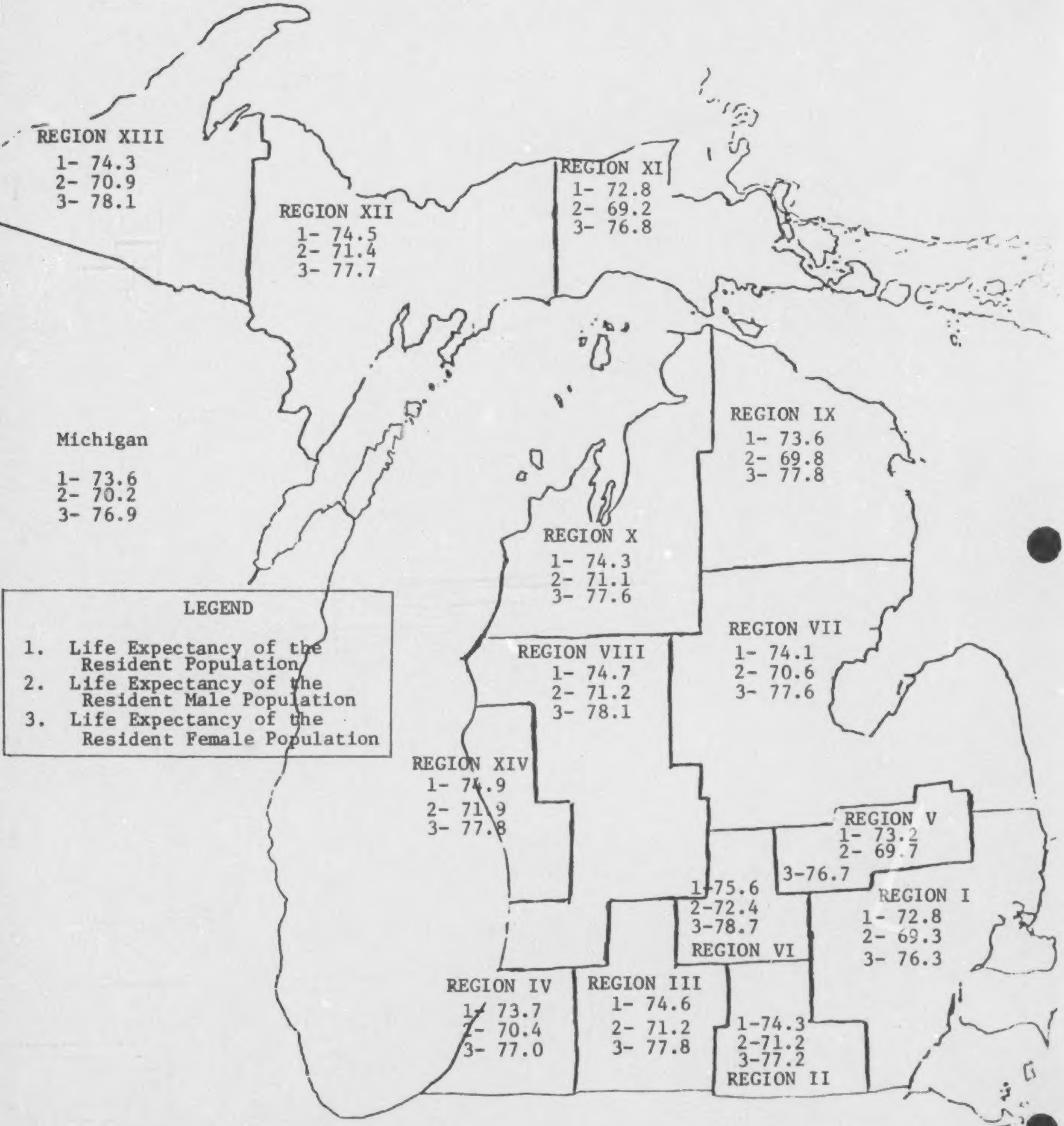
FIGURE 4.6 Marriages and Marriage Rates, Divorces and Divorce Rates by Region[1], Michigan Residents, 1981


REGION XIII
1- 764
2- 16.6
3- 279
4- 6.0
REGION XII
1- 1,832
2- 20.1
3- 833
4- 9.1
REGION XI
1- 475
2- 20.6
3- 169
4- 7.3
Michigan
1- 85,252
2- 18.4
3- 43,167
4- 9.3
REGION IX
1- 1,200
2- 20.5
3- 538
4- 9.2
REGION X
1- 2,325
2- 21.9
3- 1,153
4- 10.9
LEGEND
1. Number Marriages
2. Marriage Rate
3. Number Divorces
4. Divorce Rate
REGION VIII
1- 7,964
2- 20.9
3- 3,720
4- 9.7
REGION VII
1- 7,131
2- 18.5
3- 3,012
4- 7.8
REGION XIV
1- 3,232
2- 19.0
3- 1,454
4- 8.6
REGION V
1- 5,743
2- 19.4
3-3,112
4-10.5
1- 4,108
2- 19.5
3-2,012
4- 9.5
REGION VI
REGION I
1- 40,009
2- 17.2
3- 21,118
4- 9.1
REGION IV
1- 2,771
2- 19.3
3- 1,555
4- 10.8
REGION III
1- 5,033
2- 20.0
3- 2,789
4- 11.1
1- 2,665
2- 18.9
3- 1,423
4- 10.1
REGION II

---

[1] State Planning and Developement Regions - August, 1973

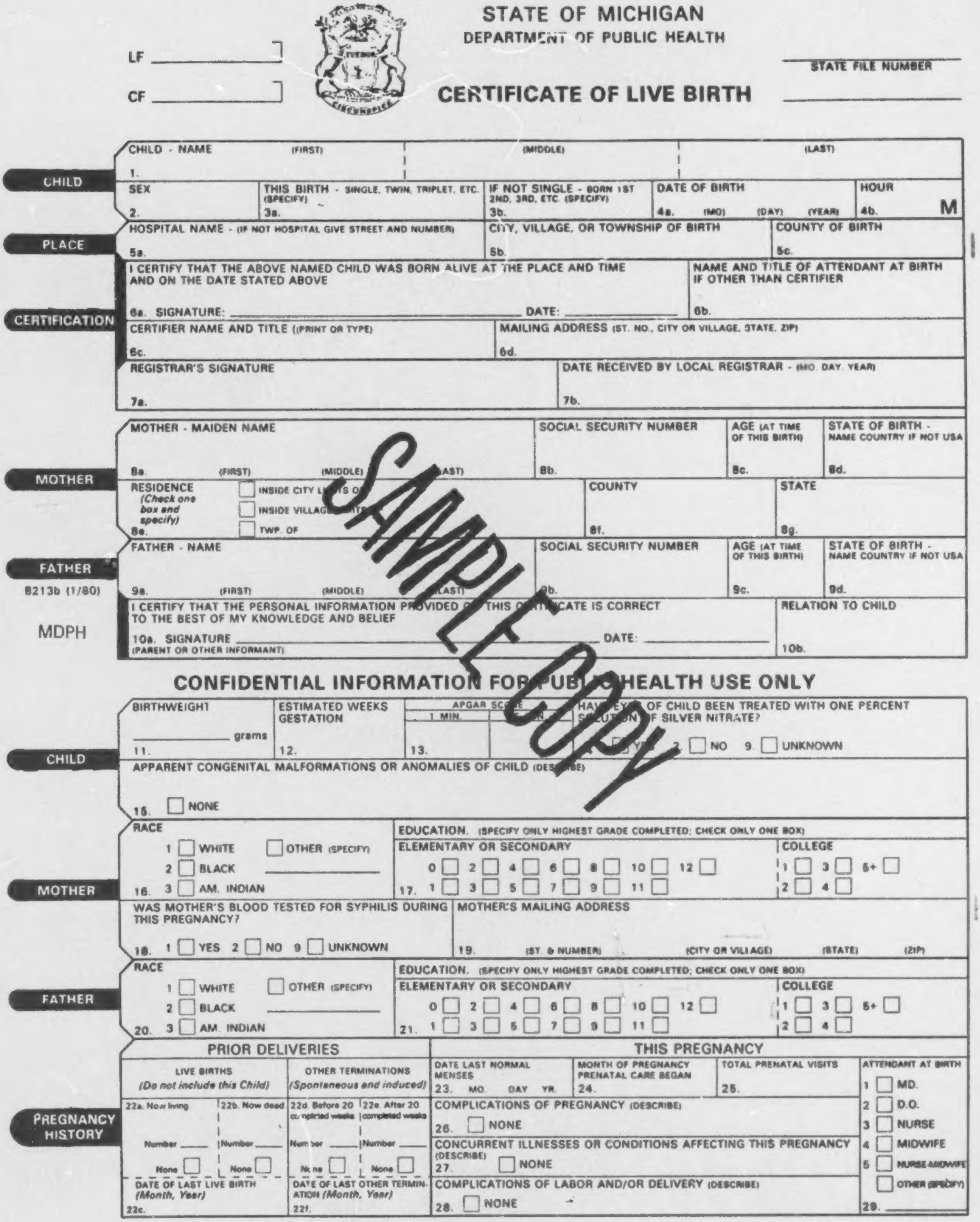
FIGURE 4.7 Life Expectancy at Birth By Sex By Region[1]
Michigan Residents, 1979-1981


REGION XIII
1- 74.3
2- 70.9
3- 78.1
REGION XII
1- 74.5
2- 71.4
3- 77.7
REGION XI
1- 72.8
2- 69.2
3- 76.8
Michigan
1- 73.6
2- 70.2
3- 76.9
REGION IX
1- 73.6
2- 69.8
3- 77.8
REGION X
1- 74.3
2- 71.1
3- 77.6
LEGEND
1. Life Expectancy of the Resident Population
2. Life Expectancy of the Resident Male Population
3. Life Expectancy of the Resident Female Population
REGION VIII
1- 74.7
2- 71.2
3- 78.1
REGION VII
1- 74.1
2- 70.6
3- 77.6
REGION XIV
1- 74.9
2- 71.9
3- 77.8
REGION V
1- 73.2
2- 69.7
3-76.7
1-75.6
2-72.4
3-78.7
REGION VI
REGION I
1- 72.8
2- 69.3
3- 76.3
REGION IV
1- 73.7
2- 70.4
3- 77.0
REGION III
1- 74.6
2- 71.2
3- 77.8
1-74.3
2-71.2
3-77.2
REGION II

---

[1] State Planning and Developement Regions - August, 1973

Figure 4.8



STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH

LF ____________

CF ____________

CERTIFICATE OF LIVE BIRTH

STATE FILE NUMBER ____________

CHILD

CHILD - NAME (FIRST) (MIDDLE) (LAST) 1.

SEX 2. | THIS BIRTH - SINGLE, TWIN, TRIPLET, ETC. (SPECIFY) 3a. | IF NOT SINGLE - BORN 1ST 2ND, 3RD, ETC. (SPECIFY) 3b. | DATE OF BIRTH 4a. (MO) (DAY) (YEAR) | HOUR 4b. M

PLACE

HOSPITAL NAME - (IF NOT HOSPITAL GIVE STREET AND NUMBER) 5a. | CITY, VILLAGE, OR TOWNSHIP OF BIRTH 5b. | COUNTY OF BIRTH 5c.

CERTIFICATION

I CERTIFY THAT THE ABOVE NAMED CHILD WAS BORN ALIVE AT THE PLACE AND TIME AND ON THE DATE STATED ABOVE

6a. SIGNATURE: ____________ DATE: ____________

NAME AND TITLE OF ATTENDANT AT BIRTH IF OTHER THAN CERTIFIER 6b.

CERTIFIER NAME AND TITLE ((PRINT OR TYPE) 6c. | MAILING ADDRESS (ST. NO., CITY OR VILLAGE, STATE, ZIP) 6d.

REGISTRAR'S SIGNATURE 7a. | DATE RECEIVED BY LOCAL REGISTRAR - (MO. DAY. YEAR) 7b.

MOTHER

MOTHER - MAIDEN NAME 8a. (FIRST) (MIDDLE) (LAST) | SOCIAL SECURITY NUMBER 8b. | AGE (AT TIME OF THIS BIRTH) 8c. | STATE OF BIRTH - NAME COUNTRY IF NOT USA 8d.

RESIDENCE *(Check one box and specify)* 8e.
☐ INSIDE CITY LIMITS OF
☐ INSIDE VILLAGE LIMITS OF
☐ TWP. OF

COUNTY 8f. | STATE 8g.

FATHER

FATHER - NAME 9a. (FIRST) (MIDDLE) (LAST) | SOCIAL SECURITY NUMBER 9b. | AGE (AT TIME OF THIS BIRTH) 9c. | STATE OF BIRTH - NAME COUNTRY IF NOT USA 9d.

B213b (1/80)

MDPH

I CERTIFY THAT THE PERSONAL INFORMATION PROVIDED ON THIS CERTIFICATE IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

10a. SIGNATURE ____________ DATE: ____________
(PARENT OR OTHER INFORMANT)

RELATION TO CHILD 10b.

SAMPLE COPY

CONFIDENTIAL INFORMATION FOR PUBLIC HEALTH USE ONLY

CHILD

BIRTHWEIGHT ____________ grams 11. | ESTIMATED WEEKS GESTATION 12. | APGAR SCORE 1 MIN. 5 MIN. 13.

HAVE EYES OF CHILD BEEN TREATED WITH ONE PERCENT SOLUTION OF SILVER NITRATE?
14. 1. ☐ YES 2. ☐ NO 9. ☐ UNKNOWN

APPARENT CONGENITAL MALFORMATIONS OR ANOMALIES OF CHILD (DESCRIBE)
15. ☐ NONE

MOTHER

RACE 16.
1 ☐ WHITE ☐ OTHER (SPECIFY) ____________
2 ☐ BLACK
3 ☐ AM. INDIAN

EDUCATION. (SPECIFY ONLY HIGHEST GRADE COMPLETED; CHECK ONLY ONE BOX) 17.
ELEMENTARY OR SECONDARY
0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10 ☐ 12 ☐
1 ☐ 3 ☐ 5 ☐ 7 ☐ 9 ☐ 11 ☐
COLLEGE
1 ☐ 3 ☐ 5+ ☐
2 ☐ 4 ☐

WAS MOTHER'S BLOOD TESTED FOR SYPHILIS DURING THIS PREGNANCY?
18. 1 ☐ YES 2 ☐ NO 9 ☐ UNKNOWN

MOTHER'S MAILING ADDRESS
19. (ST. & NUMBER) (CITY OR VILLAGE) (STATE) (ZIP)

FATHER

RACE 20.
1 ☐ WHITE ☐ OTHER (SPECIFY) ____________
2 ☐ BLACK
3 ☐ AM. INDIAN

EDUCATION. (SPECIFY ONLY HIGHEST GRADE COMPLETED; CHECK ONLY ONE BOX) 21.
ELEMENTARY OR SECONDARY
0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10 ☐ 12 ☐
1 ☐ 3 ☐ 5 ☐ 7 ☐ 9 ☐ 11 ☐
COLLEGE
1 ☐ 3 ☐ 5+ ☐
2 ☐ 4 ☐

PREGNANCY HISTORY

PRIOR DELIVERIES

LIVE BIRTHS *(Do not include this Child)*
22a. Now living Number ____ None ☐
22b. Now dead Number ____ None ☐
DATE OF LAST LIVE BIRTH *(Month, Year)* 22c.

OTHER TERMINATIONS *(Spontaneous and induced)*
22d. Before 20 completed weeks Number ____ None ☐
22e. After 20 completed weeks Number ____ None ☐
DATE OF LAST OTHER TERMINATION *(Month, Year)* 22f.

THIS PREGNANCY

DATE LAST NORMAL MENSES 23. MO. DAY YR. | MONTH OF PREGNANCY PRENATAL CARE BEGAN 24. | TOTAL PRENATAL VISITS 25.

COMPLICATIONS OF PREGNANCY (DESCRIBE)
26. ☐ NONE

CONCURRENT ILLNESSES OR CONDITIONS AFFECTING THIS PREGNANCY (DESCRIBE)
27. ☐ NONE

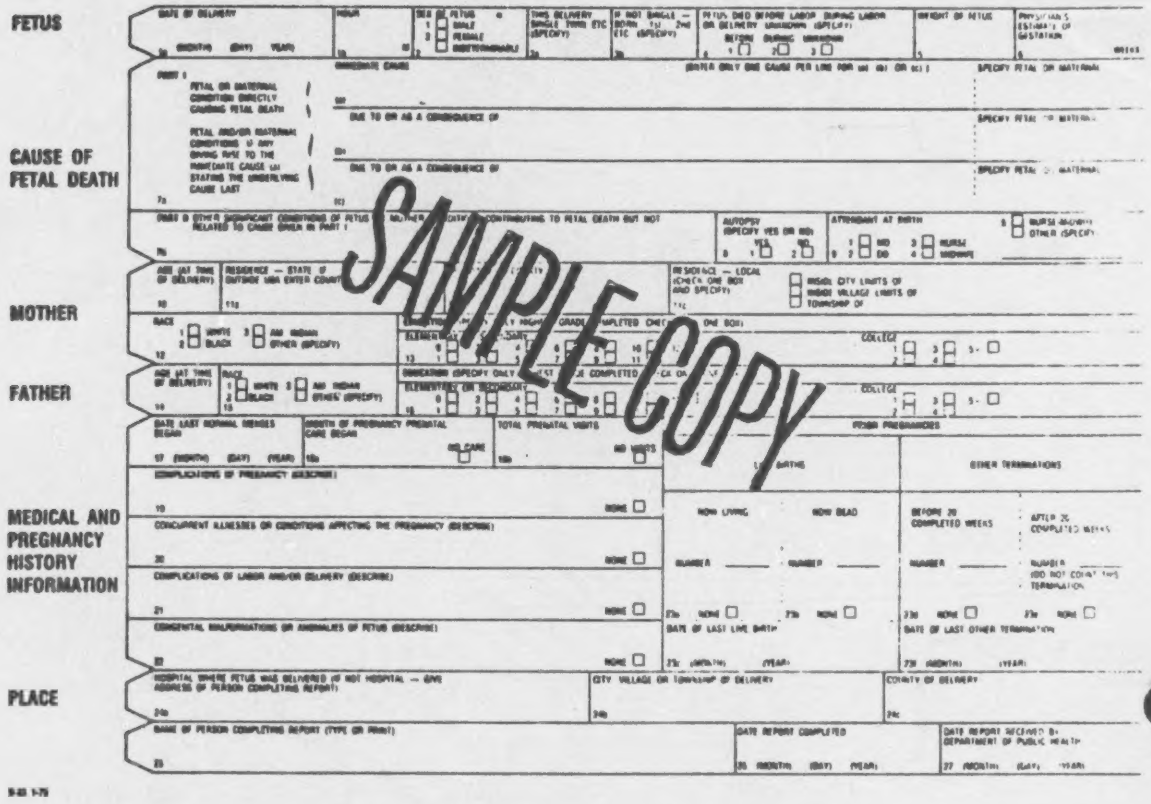
COMPLICATIONS OF LABOR AND/OR DELIVERY (DESCRIBE)
28. ☐ NONE

ATTENDANT AT BIRTH
1 ☐ MD.
2 ☐ D.O.
3 ☐ NURSE
4 ☐ MIDWIFE
5 ☐ NURSE-MIDWIFE
☐ OTHER (SPECIFY)
29. ____________

FIGURE 4.9

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
REPORT OF FETAL DEATH
(TYPE OR PRINT IN INK)

REPORT NUMBER ________


FETUS
CAUSE OF FETAL DEATH
MOTHER
FATHER
MEDICAL AND PREGNANCY HISTORY INFORMATION
PLACE
SAMPLE COPY

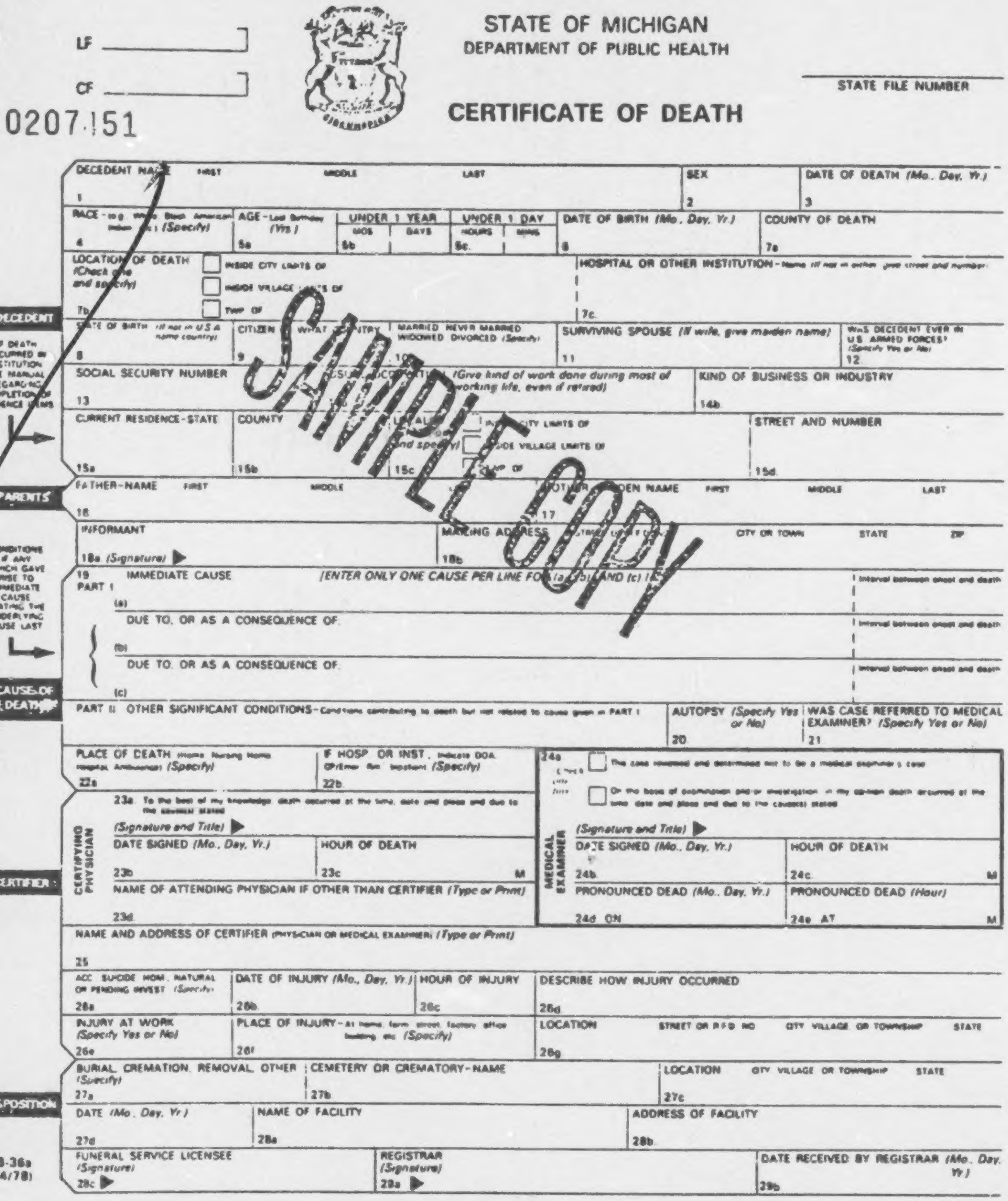
INSTRUCTIONS

Michigan Public Act 368 of 1978 requires the reporting of the death of a fetus which has completed 20 weeks of gestation or weighs at least 400 grams to the state registrar within 5 days after delivery. Responsibility for filing fetal death reports lies with the following: 1) the institution where the fetus is delivered; 2) the attending physician if delivered outside an institution; 3) the medical examiner, when investigation by the medical examiner is required.

As these reports are necessary in the development of important statistical health measures for the state, including fetal and perinatal mortality, and the analysis of various variables associated to fetal death outcomes, it is important that each report be as accurrate and complete as is possible.

DO NOT REPORT THE NAME OF THE BIOLOGICAL PARENTS, OR OTHER INFORMATION WHICH WOULD MAKE IT POSSIBLE TO IDENTIFY EITHER PARENT.

FIGURE 4.10



LF
CF
0207151

STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH

STATE FILE NUMBER

CERTIFICATE OF DEATH

SAMPLE COPY

DECEDENT
DECEDENT NAME FIRST MIDDLE LAST 1
SEX 2
DATE OF DEATH (Mo., Day, Yr.) 3
RACE - (e.g. White, Black, American Indian, etc.) (Specify) 4
AGE - Last Birthday (Yrs.) 5a
UNDER 1 YEAR MOS DAYS 5b
UNDER 1 DAY HOURS MINS 5c
DATE OF BIRTH (Mo., Day, Yr.) 6
COUNTY OF DEATH 7a
LOCATION OF DEATH (Check one and specify) 7b
☐ INSIDE CITY LIMITS OF
☐ INSIDE VILLAGE LIMITS OF
☐ TWP OF
HOSPITAL OR OTHER INSTITUTION - Name (If not in either, give street and number) 7c
STATE OF BIRTH (If not in U.S.A. name country) 8
CITIZEN OF WHAT COUNTRY 9
MARRIED, NEVER MARRIED, WIDOWED, DIVORCED (Specify) 10
SURVIVING SPOUSE (If wife, give maiden name) 11
WAS DECEDENT EVER IN U.S. ARMED FORCES? (Specify Yes or No) 12
SOCIAL SECURITY NUMBER 13
USUAL OCCUPATION (Give kind of work done during most of working life, even if retired) 14a
KIND OF BUSINESS OR INDUSTRY 14b

IF DEATH OCCURRED IN INSTITUTION SEE MANUAL REGARDING COMPLETION OF RESIDENCE ITEMS

CURRENT RESIDENCE - STATE 15a
COUNTY 15b
LOCALITY (Check one and specify) 15c
☐ INSIDE CITY LIMITS OF
☐ INSIDE VILLAGE LIMITS OF
☐ TWP OF
STREET AND NUMBER 15d

PARENTS
FATHER - NAME FIRST MIDDLE LAST 16
MOTHER - MAIDEN NAME FIRST MIDDLE LAST 17
INFORMANT 18a (Signature) ▶
MAILING ADDRESS STREET OR R.F.D. NO. CITY OR TOWN STATE ZIP 18b

CAUSE OF DEATH
CONDITIONS IF ANY WHICH GAVE RISE TO IMMEDIATE CAUSE STATING THE UNDERLYING CAUSE LAST

19 PART I IMMEDIATE CAUSE [ENTER ONLY ONE CAUSE PER LINE FOR (a), (b), AND (c).] Interval between onset and death
(a)
DUE TO, OR AS A CONSEQUENCE OF: Interval between onset and death
(b)
DUE TO, OR AS A CONSEQUENCE OF: Interval between onset and death
(c)
PART II OTHER SIGNIFICANT CONDITIONS - Conditions contributing to death but not related to cause given in PART I
AUTOPSY (Specify Yes or No) 20
WAS CASE REFERRED TO MEDICAL EXAMINER? (Specify Yes or No) 21

CERTIFIER
PLACE OF DEATH (Home, Nursing Home, Hospital, Ambulance) (Specify) 22a
IF HOSP. OR INST., Indicate DOA, OP/Emer. Rm., Inpatient (Specify) 22b

CERTIFYING PHYSICIAN
23a To the best of my knowledge, death occurred at the time, date and place and due to the cause(s) stated.
(Signature and Title) ▶
DATE SIGNED (Mo., Day, Yr.) 23b
HOUR OF DEATH 23c M
NAME OF ATTENDING PHYSICIAN IF OTHER THAN CERTIFIER (Type or Print) 23d

MEDICAL EXAMINER
24a Check one
☐ The case reviewed and determined not to be a medical examiner's case
☐ On the basis of examination and/or investigation, in my opinion death occurred at the time, date and place and due to the cause(s) stated.
(Signature and Title) ▶
DATE SIGNED (Mo., Day, Yr.) 24b
HOUR OF DEATH 24c M
PRONOUNCED DEAD (Mo., Day, Yr.) 24d ON
PRONOUNCED DEAD (Hour) 24e AT M

NAME AND ADDRESS OF CERTIFIER (PHYSICIAN OR MEDICAL EXAMINER) (Type or Print) 25
ACC., SUICIDE, HOM., NATURAL OR PENDING INVEST. (Specify) 26a
DATE OF INJURY (Mo., Day, Yr.) 26b
HOUR OF INJURY 26c
DESCRIBE HOW INJURY OCCURRED 26d
INJURY AT WORK (Specify Yes or No) 26e
PLACE OF INJURY - At home, farm, street, factory, office building, etc. (Specify) 26f
LOCATION STREET OR R.F.D. NO. CITY, VILLAGE, OR TOWNSHIP STATE 26g

DISPOSITION
BURIAL, CREMATION, REMOVAL, OTHER (Specify) 27a
CEMETERY OR CREMATORY - NAME 27b
LOCATION CITY, VILLAGE, OR TOWNSHIP STATE 27c
DATE (Mo., Day, Yr.) 27d
NAME OF FACILITY 28a
ADDRESS OF FACILITY 28b
FUNERAL SERVICE LICENSEE (Signature) 28c ▶
REGISTRAR (Signature) 29a ▶
DATE RECEIVED BY REGISTRAR (Mo., Day, Yr.) 29b

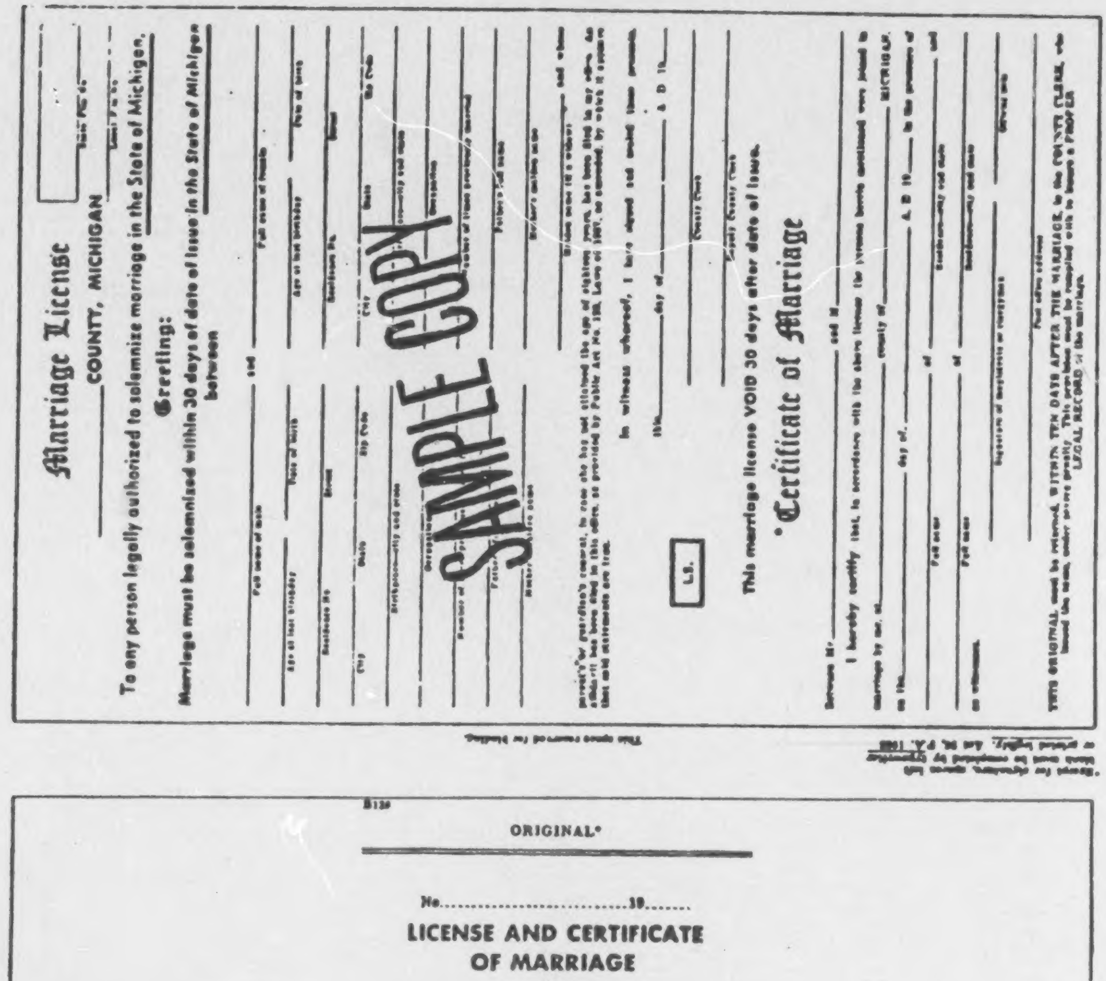
B-36a
(4/78)

Michigan Public Act 343 of 1925, as amended, requires that the attending physician, or in the absence of an attending physician, a medical examiner shall fill out and sign the medical certificate of death within 48 hours after death.

The funeral director is responsible for completing all other portions of the certificate and obtaining a burial or removal permit prior to disposing of the body or removing from the registration district where the death occurred.

MDPH

FIGURE 4.11



Marriage License

_____________ COUNTY, MICHIGAN

To any person legally authorized to solemnize marriage in the State of Michigan,

Greeting:

Marriage must be solemnized within 30 days of date of issue in the State of Michigan between

Full name of male — and — Full name of female

Age at last birthday — Date of birth — Age at last birthday — Date of birth

Residence No. — Street — Residence No. — Street

City — State — Zip Code — City — State — Zip Code

Birthplace—city and state — Birthplace—city and state

Occupation — Occupation

Number of times previously married — Number of times previously married

Father's full name — Father's full name

Mother's maiden name — Mother's maiden name

Bride's name if a widow — and whose

In witness whereof, I have signed and sealed these presents,

this ________ day of ____________ A. D. 19___

L.S.

County Clerk

Deputy County Clerk

This marriage license VOID 30 days after date of issue.

*Certificate of Marriage

Between Mr. ____________________ and M ____________________

I hereby certify that, in accordance with the above license the persons herein mentioned were joined in marriage by me, at ____________ county of ____________ MICHIGAN, on the ________ day of ____________ A. D. 19___ in the presence of

Full name — of — Residence—city and state — and

Full name — of — Residence—city and state

as witnesses.

Signature of magistrate or clergyman — Official title

Post office address

THIS ORIGINAL must be returned, WITHIN TEN DAYS AFTER THE MARRIAGE, to the COUNTY CLERK, who issued the same, under severe penalty. This provision must be complied with to insure a PROPER LEGAL RECORD of the marriage.

This space reserved for binding.

B120

ORIGINAL*

No............................19.......

LICENSE AND CERTIFICATE OF MARRIAGE

....

and

....

CLERK'S OFFICE

County of..............................

Received for record the ....day of

............................A. D. 19....... and recorded

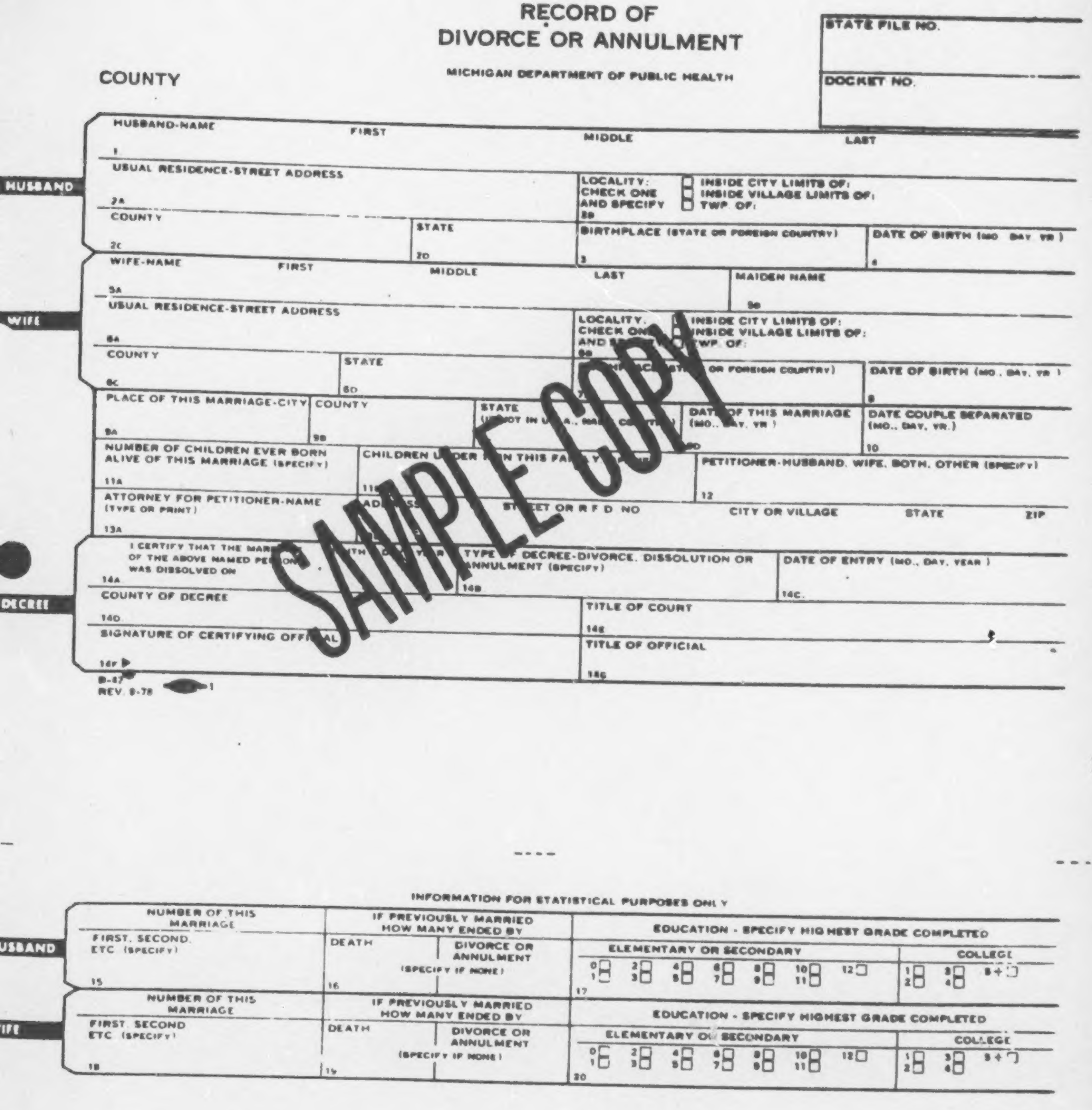
in liber.............of marriages, on page...............

.... Clerk

*THIS ORIGINAL must be returned WITHIN TEN DAYS AFTER THE MARRIAGE, to the County Clerk who issued the same, under severe penalty. This provision must be complied with to insure a PROPER LEGAL RECORD of the marriage.

THE DUPLICATE must be delivered to one of the parties joined in marriage.

FIGURE 4.12



RECORD OF DIVORCE OR ANNULMENT

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

COUNTY

STATE FILE NO.

DOCKET NO.

SAMPLE COPY

HUSBAND

1 HUSBAND-NAME FIRST MIDDLE LAST

2A USUAL RESIDENCE-STREET ADDRESS

2B LOCALITY: CHECK ONE AND SPECIFY ☐ INSIDE CITY LIMITS OF: ☐ INSIDE VILLAGE LIMITS OF: ☐ TWP. OF:

2C COUNTY

2D STATE

3 BIRTHPLACE (STATE OR FOREIGN COUNTRY)

4 DATE OF BIRTH (MO. DAY YR.)

WIFE

5A WIFE-NAME FIRST MIDDLE LAST

5B MAIDEN NAME

6A USUAL RESIDENCE-STREET ADDRESS

6B LOCALITY. CHECK ONE AND SPECIFY ☐ INSIDE CITY LIMITS OF: ☐ INSIDE VILLAGE LIMITS OF: ☐ TWP. OF:

6C COUNTY

6D STATE

7 BIRTHPLACE (STATE OR FOREIGN COUNTRY)

8 DATE OF BIRTH (MO., DAY, YR.)

9A PLACE OF THIS MARRIAGE-CITY

9B COUNTY

9C STATE (IF NOT IN U.S.A., NAME COUNTRY)

9D DATE OF THIS MARRIAGE (MO., DAY, YR.)

10 DATE COUPLE SEPARATED (MO., DAY, YR.)

11A NUMBER OF CHILDREN EVER BORN ALIVE OF THIS MARRIAGE (SPECIFY)

11B CHILDREN UNDER 18 IN THIS FAMILY

12 PETITIONER-HUSBAND, WIFE, BOTH, OTHER (SPECIFY)

13A ATTORNEY FOR PETITIONER-NAME (TYPE OR PRINT)

13B ADDRESS STREET OR R F D NO CITY OR VILLAGE STATE ZIP

DECREE

14A I CERTIFY THAT THE MARRIAGE OF THE ABOVE NAMED PERSONS WAS DISSOLVED ON (MONTH, DAY, YEAR)

14B TYPE OF DECREE-DIVORCE, DISSOLUTION OR ANNULMENT (SPECIFY)

14C. DATE OF ENTRY (MO., DAY, YEAR)

14D COUNTY OF DECREE

14E TITLE OF COURT

14F ▶ SIGNATURE OF CERTIFYING OFFICIAL

14G TITLE OF OFFICIAL

B-87
REV. 8-78

INFORMATION FOR STATISTICAL PURPOSES ONLY

HUSBAND

15 NUMBER OF THIS MARRIAGE FIRST, SECOND, ETC. (SPECIFY)

16 IF PREVIOUSLY MARRIED HOW MANY ENDED BY DEATH DIVORCE OR ANNULMENT (SPECIFY IF NONE)

17 EDUCATION - SPECIFY HIGHEST GRADE COMPLETED
ELEMENTARY OR SECONDARY 0☐ 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐
COLLEGE 1☐ 2☐ 3☐ 4☐ 5+☐

WIFE

18 NUMBER OF THIS MARRIAGE FIRST, SECOND ETC. (SPECIFY)

19 IF PREVIOUSLY MARRIED HOW MANY ENDED BY DEATH DIVORCE OR ANNULMENT (SPECIFY IF NONE)

20 EDUCATION - SPECIFY HIGHEST GRADE COMPLETED
ELEMENTARY OR SECONDARY 0☐ 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐
COLLEGE 1☐ 2☐ 3☐ 4☐ 5+☐